

COMMERCIAL EXPRESSWALL™



FC:126

EXTERNAL FAÇADE SYSTEM

JANUARY 2008

Cemintel Commercial Expresswall™ offers an expressed joint façade system for an extensive range of commercial and industrial applications.

cemintel™
commercial expresswall™



CSR

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DESCRIPTION

The Cemintel Commercial ExpressWall™ Façade System provides a versatile and durable façade which is suitable for an extensive range of commercial and industrial buildings types. Cemintel Commercial ExpressWall™ is a highly adaptable system which can be used to conceal most common structural materials such as masonry, precast concrete or steel and timber stud framing.

ExpressPanel™ is 9mm thick compressed, autoclaved, cellulose fibre reinforced cement sheets, purpose made for use on building façades. ExpressPanel™ is a square edge sheet with a smooth flat surface suitable for painting.

The panels are supported by vertical Top Hats and fixed with exposed or concealed screws. The panels may be arranged in a variety of patterns, and surface relief is produced by expressed joint finishing.

APPLICATIONS

The Cemintel Commercial ExpressWall™ system has been designed to be used for external cladding buildings such as:

- Supermarkets and Shopping centres.
- Office Buildings.
- Most Commercial Buildings.
- Residential Homes and Apartment Buildings.
- Or any other application not excluded by the Design Considerations section of this brochure.

It however remains the responsibility of the building designer to verify the Cemintel Commercial ExpressWall™ system is suitable for the particular requirements of any given project.

The Cemintel Commercial ExpressWall™ System has excellent resistance to water penetration and high wind loads, and is suitable for exposed applications.

The Commercial ExpressWall™ System can also be used as an exterior ceiling. Contact CSR Gyprock & Fibre Cement for details.

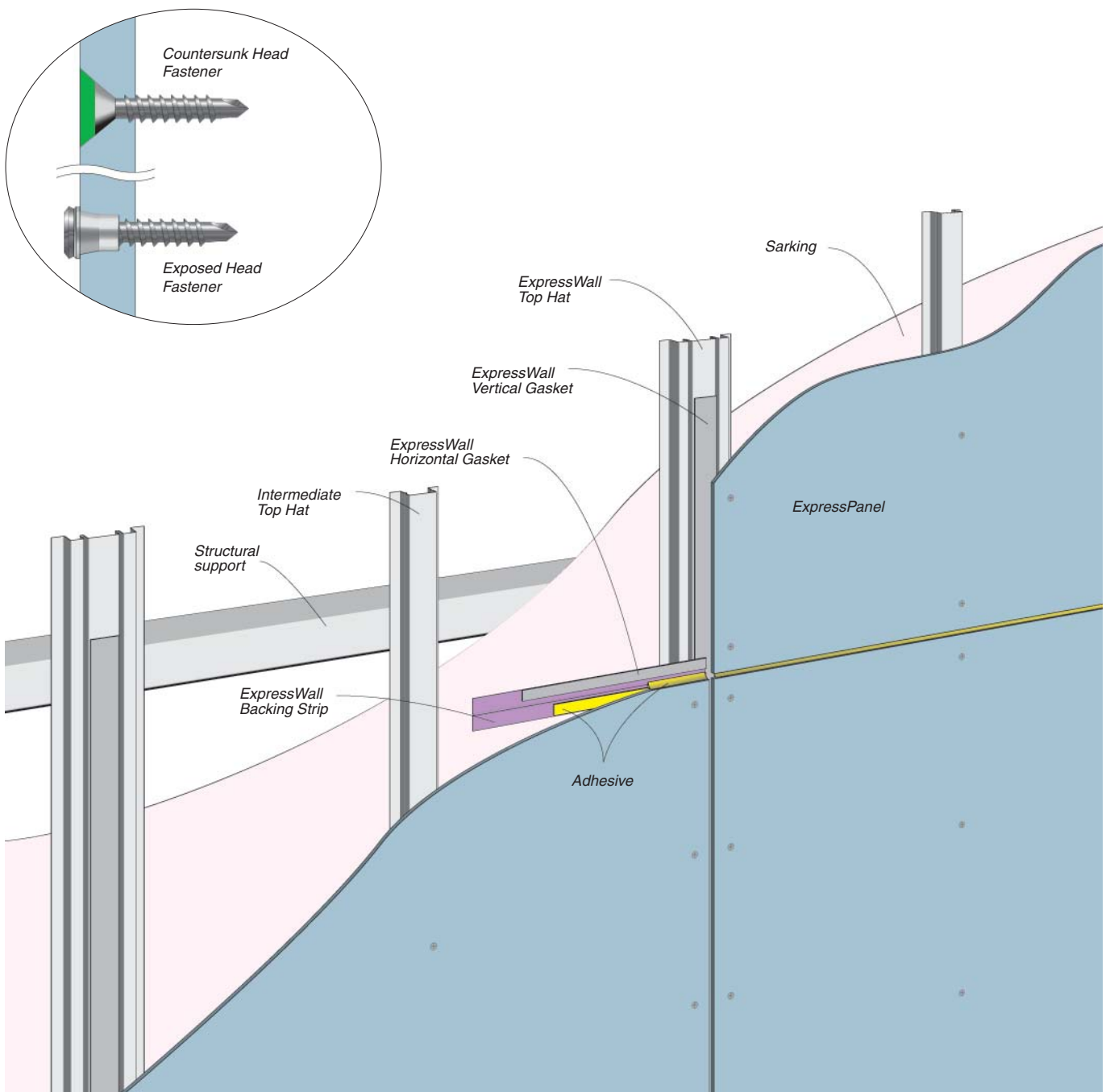
COMMERCIAL EXPRESSWALL™ ADVANTAGES

DESIGN FEATURES

- Flat, smooth finish with countersunk screws.
- Exposed Head fastener option for prepainted panels.
- Expressed joint appearance.
- Tested weather resistance.
- Designed for extreme wind pressures.
- Lightweight, low maintenance façade system.
- Readily accepts many forms of decorative finish.
- Suitable for curved applications.

CONSTRUCTION FEATURES

- Highly durable gaskets.
- Dimensionally accurate panels.
- Set-out tolerance for fixing framing.
- High prefabrication opportunity.
- Panels easily replaced.
- High performance ExpressWall™ Top Hat 1.15:
 - Suitable for Exposed Head Screws
 - Suitable for Cyclonic Areas
 - Wider fixing surface for increased fixing tolerance.



COMPONENTS

EXPRESSPANEL™

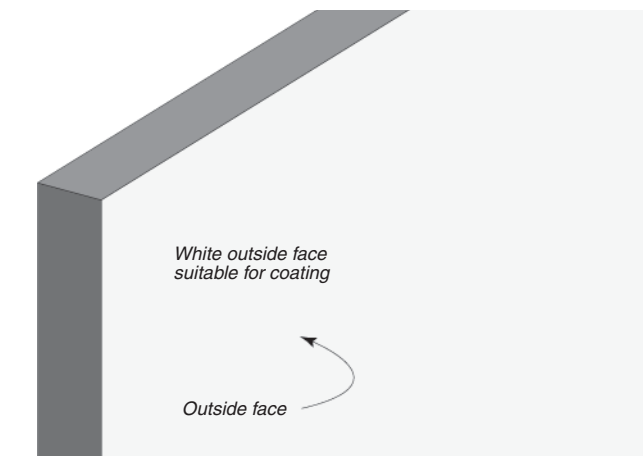
ExpressPanel™ is a compressed fibre cement sheet which is purpose manufactured for use in building façades. ExpressPanel™ is factory sealed on both faces and all edges. The white face is ready to accept a wide range of finishes. ExpressPanel™ is 9mm thick, has a mass of 17kg/m², and is available in the following panel sizes.

ExpressPanel™ Sizes. (All panels 9mm thickness)

Width (mm)	Length (mm)				
	1800	2100	2400	2700	3000
900	✓		✓		✓
1200	✓	✓	✓	✓	✓

NOTE: Please contact CSR Gyprock & Fibre Cement for non-standard ExpressPanel™ sizes.

ExpressPanel™ Face Identification



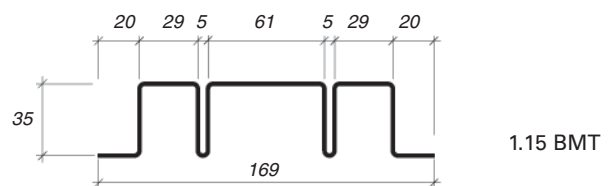
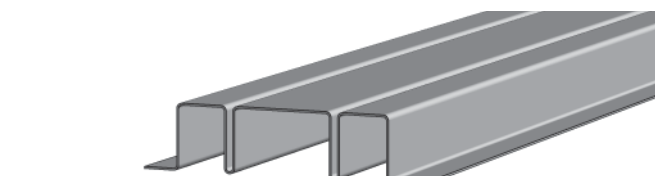
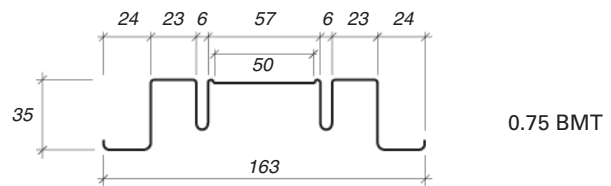
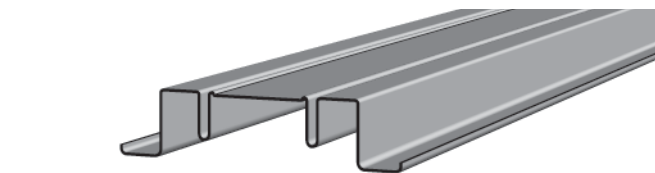
EXPRESSWALL™ TOP HAT

ExpressWall™ Top Hat is a purpose designed rolled steel section for supporting the vertical edges of the ExpressPanel™. The unique profile also acts to accommodate movement of the sheets at the vertical joints. It is designed to be used in conjunction with the ExpressWall™ Vertical Gasket.

ExpressWall™ Top Hat is manufactured from galvanised (Z275) steel, and is the subject of patent application N°2003 900205.

ExpressWall™ Top Hat 1.15 BMT is required for cyclonic areas and when exposed head screws are to be used.

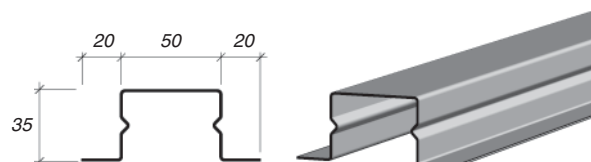
BMT	Order N°	Length (m)	Mass kg/m
1.15	39124	6.0	3.25
0.75	84746	6.0	1.97



INTERMEDIATE TOP HAT

Intermediate Top Hat is used to support the ExpressPanel™ at locations other than vertical joints. Intermediate Top Hat is a Rondo rolled steel section which is manufactured from galvanised (Z275) steel of 1.15mm BMT.

BMT	Order N°	Length (m)	Mass kg/m
1.15	21086	3.6	1.38
1.15	21083	7.2	1.38



EXPRESSWALL™ VERTICAL GASKET

ExpressWall™ vertical gasket is made from EPDM closed cell foam which has high UV resistance. The gasket has adhesive on one side (with a release paper), and is adhered to the ExpressWall™ Top Hat to prevent moisture entry at vertical joints.



Order N°	Description
22106	3.2mm x 48mm x 25m roll (Tesa 61102)

EXPRESSWALL™ HORIZONTAL GASKET

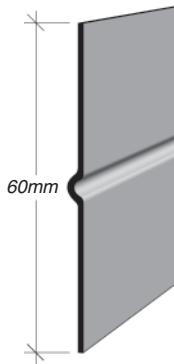
ExpressWall™ horizontal gasket is made from closed cell PVC Nitrile foam which has a high resistance to abrasion and maintains its properties at high temperatures. The gasket has adhesive on one side (with a release paper), and is adhered to the ExpressWall™ Backing Strip to prevent moisture entry at horizontal joints.



Order N°	Description
22105	3.0mm x 18mm x 9m roll (Tesa 50601)

EXPRESSWALL™ BACKING STRIP

ExpressWall™ Backing Strip is a rolled steel section designed to support the gasket and/or sealant behind the horizontal expressed joints. ExpressWall™ Backing Strip is manufactured from high tensile Colorbond steel, and is black in colour.

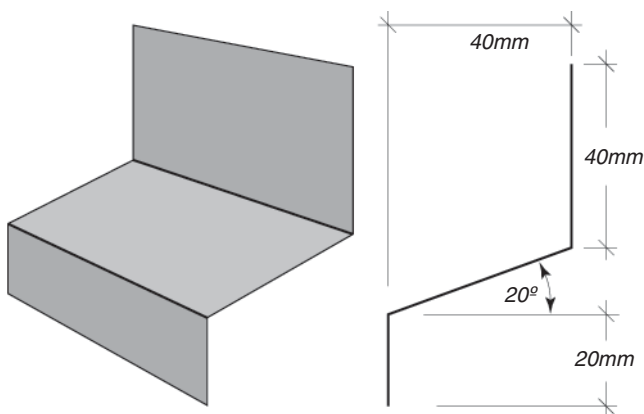


Order N°	Length
21089	1194mm
21088	2394mm
21087	2994mm

CAVITY BAFFLE

PVC profile used at base of wall to exclude vermin and moisture.

Order No	Length
38651	3.0m



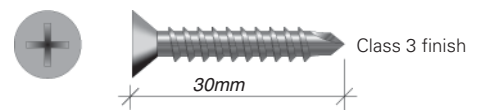
EXPRESSWALL™ SCREW

ExpressWall™ Screws are specially designed for the ExpressWall™ System. They are the only screws recommended by CSR for fixing ExpressPanel™ to the steel top hats.

• Countersunk Head Screw:

The countersunk head allows concealed fixing, and the buttress thread is designed to provide maximum holding power in light gauge steel. It has a Class 3 finish and is grey in colour.

Order N°	Description
28624	Countersunk Head Class 3 Finish 1000/pack

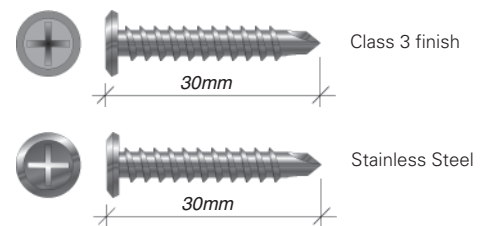


• Exposed Head Screw:

(Suitable for ExpressWall™ Top Hat 1.15. ONLY).

The Exposed Head Screw has a buttress thread which is designed to provide maximum holding power in light gauge steel. It is available in Class 3 finish and Stainless Steel (grade 410).

Order N°	Description
28625	Wafer Head Class 3 Finish 1000/pack
28626	Wafer Head Stainless Steel 1000/pack



• Hex Head Screw

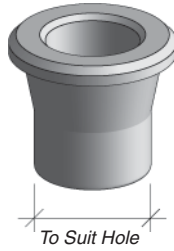
For fixing top hats to steel framing in non-cyclonic areas. Hex head self drilling screw 12-14 x 20. (Suitability to be confirmed by project engineer).



Order N°	Qty
84882	100

EXPRESSWALL WEATHER SEAL

The ExpressWall™ Weather Seal is a grey, UV stabilised nylon washer. It is used with ExpressWall™ Exposed Head Screws to provide an interference fit, delivering high weather resistance and acting to lock the screw into position.



Order N°	Description
36484	Weather Seal

COUNTERSINKING TOOL

This is a tungsten carbide tipped tool specifically designed for drilling and countersinking the required 6mm diameter screw holes in ExpressPanel™. It is suitable for use with screw guns and drills, and has an adjustable depth setting. This is the only tool recommended by CSR for this purpose. Use only for countersunk head screws.



Order N°	Description
22116	Countersinking Tool

BACKING STRIP ADHESIVE

An adhesive is used for fixing ExpressWall™ Backing Strip to ExpressWall™ panel. The recommended product is Sikaflex®-11FC. This product is not recommended for filling expressed joints.

Order N°	Description
39378	Sikaflex® 11FC, 310ml tube

SARKING

Bradford foil products are used to provide thermal insulation and moisture protection. Thermofoil 733 is a double reflective foil for high thermal rating.

Product	Order N°	Qty
EnviroSeal™ Wall Wrap	13462	1350mm x 20m roll
Thermofoil 733	81333	1350mm x 60m roll

SEALANT

Sealant is used to seal ExpressWall™ joints for high wind loads, control joints, junctions, etc. Can be painted over with most paints. It is also required at expressed joints where pre-painted ExpressPanel™ has been used.

Order N°	Description
11378	Sikaflex® PRO, 310ml tube (colour Grey)
39488	Sikaflex® PRO, 310ml tube (colour Black)

Other sealants may be used for decorative purposes, when approved by the manufacturer.

EPOXY

Epoxy is used to conceal the countersunk fastener heads, to prevent moisture penetration, and to provide a flat surface for decorative coating. Epoxy products must be installed to the manufacturer's recommendations.

Recommended products are:

- Megapoxy P1.
- Hilti CA125*.
- Hilti CA273* (should be used when ambient temperature is less than 15°C at time of installation)

Order N°	Description
25464	Megapoxy P1, 1 litre kit

BOND-BREAKER TAPE

Bond-breaker tape is used behind sealant at horizontal joints, for example when the design wind pressure exceeds 4.0kPa.

Order N°	Description
13172	Tesa 7492 (3.2mm x 48mm x 25m).

BACKING ROD*

Backing rod is used to enable correct filling of joints with sealant. It is recommended that backing rod be of open cell type to enable sealant to cure from behind. The diameter of backing rod must be appropriate for the width of the gap being filled.



FLASHINGS & CAPPINGS*

Flashings are to be designed and installed in accordance with SAA-HB39 1997 and good building practice.

*Not supplied by CSR.

DESIGN CONSIDERATIONS

This guide represents good practice, though it is not intended as an exhaustive statement of all relevant information. It remains the responsibility of the building designer to verify that the Cemintel Commercial ExpressWall™ system is suitable for the particular requirements of any given project.

HIGH WIND LOADS

In areas where the design wind pressures exceed 4.0kPa, additional sealing is required to minimise water ingress. Refer to FIG 30 and 31 for additional details.

In cyclonic areas ExpressWall™ Top Hat 1.15mm must be used.

Wind loads in this guide refer to 'Ultimate Limit State Design Wind Pressures'.

SARKING

The Commercial ExpressWall™ façade is designed as a rain screen, and if exposed to weather, appropriately designed sarking must be used between the top hats

and the framing. If the wall is not exposed directly to the weather and will not get wet during storms, sarking is only required for insulation and condensation control. Sarking must be designed and installed in accordance with AS/NZS 4200 Part 1 : Materials, and Part 2 : Installation.

Condensation is a complex problem, and can occur under a variety of conditions, not just cold conditions. Literature on this subject is available from CSIRO/BRANZ/ASHRAE and must be consulted when building in areas where condensation is likely to occur.

In these cases, the appropriate use of a sarking as a vapour barrier or as thermal insulation, or both, can be effective in controlling condensation.

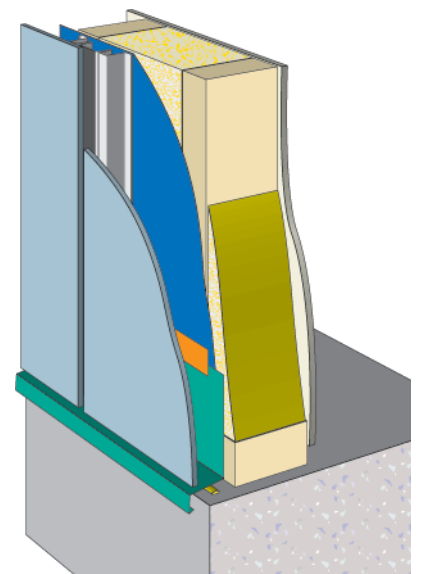
INSULATION

It is recommended that insulation materials be installed to enhance thermal insulation properties and occupant comfort. Insulation also improves the acoustic performance of the wall against outside noise.

The level of insulation provided in a wall is determined by its R-value. The higher the R-value the greater the insulation provided. Cemintel Commercial ExpressWall™ Systems incorporating Bradford R1.5 Gold Insulation can provide a thermal rating of R2.1, which is greater than many masonry systems.

THERMAL PERFORMANCE

EXPRESSWALL™			
<ul style="list-style-type: none"> 1 layer Cemintel ExpressPanel™ fixed to Cemintel ExpressWall™ top hat framing system. Insulation and Sarking as per system table. Timber or Steel Studs (90mm min.) at 600mm maximum centres. 1 layer x 10mm GYPROCK plasterboard CD fixed to the inside of framing. 			
Insulation in Cavity	Sarking	Winter Total Wall R-Value	Summer Total Wall R-Value
(a) Nil	BRADFORD ENVIROSEAL Wall Wrap under top hats	1.2	1.0
(b) Nil	BRADFORD THERMOFOIL 733 under top hats	1.7	1.4
(c) BRADFORD Gold batts R1.5	BRADFORD ENVIROSEAL Wall Wrap under top hats	2.1	1.9



NOTE: *Bradford Thermofoil 733 is sarking with reflective finish both sides. Using an alternative product with anti-glare finish will REDUCE the stated R-value performance.

PANEL FINISHES

ExpressPanel™ is factory sealed on both faces and all edges. Sealing in this manner increases the durability and stability of the panels. The exterior surface of the ExpressPanel™ must be coated with an appropriate finish. Note that the back face of panels cannot be painted, and is not suitable as an exterior finish.

Where panels are cut on-site, sealing of the cut edges shall be with Dulux Acra-Prime 501/1. The minimum application rate shall be 1 litre per 10m² (140grams/m²) which results in a dry film thickness of 70 microns. Alternatively, coat with undiluted Bondcrete before applying the finish coating.

The exterior face of ExpressPanel™ can be finished with any of a wide variety of coatings, provided they are compatible with the ExpressPanel™ seal coat, ExpressWall™ screws and with the epoxy used to cover the countersunk heads. High build, exterior grade acrylic paint or aggregate finishes provide the best results.

ExpressPanel™ may be painted off-site when exposed head screws are to be used. Refer to appropriate painting contractors for details and colours. For pre-painted panels, it is a requirement that all expressed joints are filled with sealant. Refer to Panel Installation.

A minimum dry film thickness of 250 microns is recommended to ensure adequate cover for the concealed fasteners. High gloss and low build finishes will require additional surface preparation to minimise fastener show-through. In all cases the coating manufacturer's application instructions must be followed. The inside face of the ExpressPanel™ is finished clear and is not suitable for painting.

Before applying finishes in coastal areas (refer to definition), all panels must be thoroughly washed with fresh water to remove any salt residue. Refer to coating manufacturer for additional requirements.

CONTROL JOINTS

Control joints in the Commercial ExpressWall™ system are required to correspond to control joints in the supporting structure and anywhere that significant structural movement is expected.

A horizontal control joint is required beneath slabs to accommodate any expected deflection. The magnitude of the deflection must be verified by the building designer. Refer to FIG 34 and 35.

Vertical control joints to allow for differential movement are required at the supports of fascia trusses and at the junction of structural elements of different stiffness, such as between concrete columns and stud frames. Refer to FIG 49.

DURABILITY

Cemintel ExpressPanel™ has many properties which make it a very durable product, including:

- Immune to permanent water damage in both short and long-term exposure.
- Will not rot, burn or corrode, and is unaffected by termites, air, steam, salt and sunlight.
- Not adversely affected over a temperature range of 0°C to 95°C.
- Conforms with the Building Code of Australia (BCA) requirements for external wall applications.

The durability of the ExpressWall™ system can be enhanced by periodic inspection and maintenance. Inspections should include examination of the coatings, flashings and seals. Paint finishes must be maintained in accordance with the manufacturer's recommendations. Any cracked or damaged finish or seals which would allow water ingress, must be repaired immediately by recoating or resealing the effected area, or by removing the panel and replacing gaskets. Any damaged flashings, sheets or gaskets must be replaced as for new work.

For details on system requirements in different environments refer to Table 1. It is the designer's responsibility to determine the environmental zone, based on site conditions.

The durability of the system can be increased by the additional treatment of steelwork, and by painting all exposed sealants to the sealant manufacturer's recommendations. In corrosivity category D, barriers to reduce the ingress of salt laden air are required.

Table 1: Requirements for Corrosive Environments

Environmental Zone	Corrosivity Category (AS2312)	Exposed Head Screws	Countersunk Screws	Joints	Additional Maintenance
General	A : Very Low B : Low	Class 3 or Stainless Steel	Class 3	Sealed or Expressed	–
Moderate Marine					
0-50m from shoreline	D : High	Stainless Steel	Class 3	Sealed	Wash-down
50m-1km from shoreline	C : Medium	Class 3 or Stainless Steel	Class 3	Sealed or Expressed	Wash-down
Severe Marine					
0-300m from shoreline	E : Very High	Not Suitable	Not Suitable	–	–
300m-1km from shoreline	D : High	Stainless Steel	Class 3	Sealed	Wash-down
Severe Industrial	E : Very High	Not Suitable	Not Suitable	–	–

TABLE NOTES:

- General: Non-corrosive environments.
- Moderate Marine: Areas influenced to a moderate extent by coastal salts. Generally up to 1km from a large expanse of salt water not subject to breaking surf, but may be extended further due to topography, vegetation and prevailing winds.
- Severe Marine: Areas near the coast with breaking surf. The atmosphere is highly corrosive and is characterised by strong salt smell and haze. Generally up to 1km from the shoreline, but may be extended further with prevailing winds. Includes areas such as Swan River west of the Narrows Bridge and Sydney Harbour east of the Harbour Bridge and Spit Bridge.
- Severe Industrial: Areas around major industrial complexes characterised by heavy fallout and strong sulphur and acidic smells. Also includes buildings with corrosive atmosphere from operations within.
- Seal Joints: All horizontal and vertical joints must be completely filled with sealant. Refer FIG 30 and FIG 31.
- Wash-down:
 - All walls must be sufficiently exposed from above so that rain can perform natural wash-down of the wall.

OR

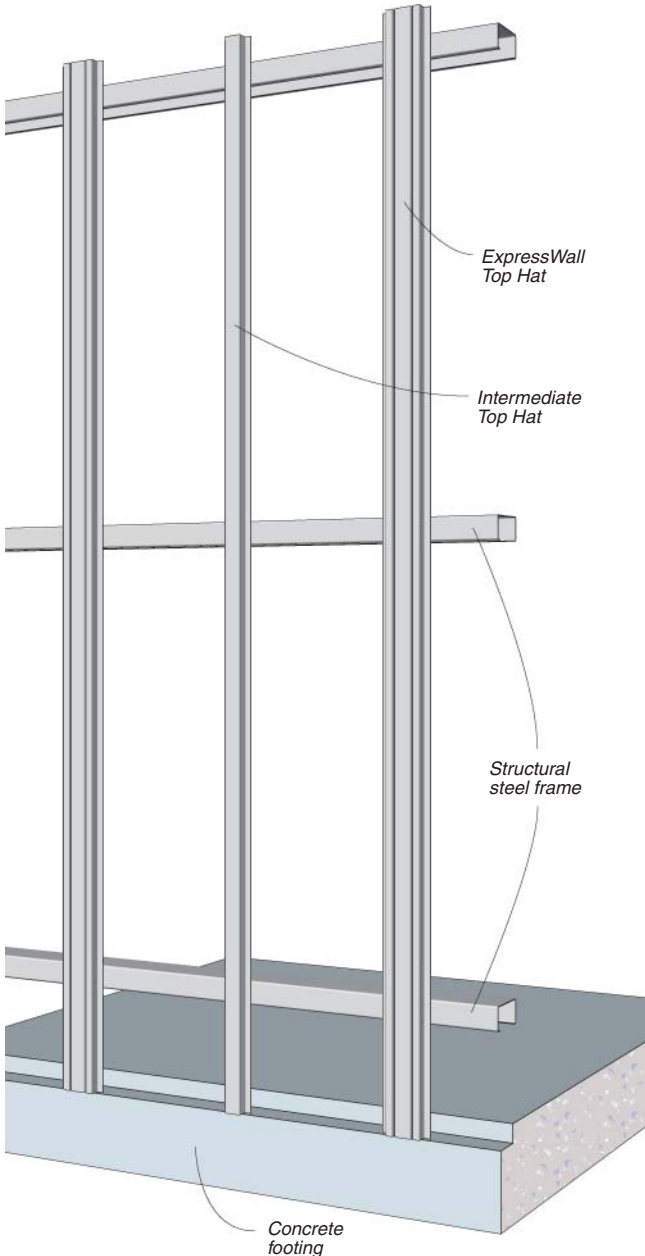
 - Walls which are protected by soffits above must be washed down twice per year, to remove salt and debris build-up, particularly at joints.
 - For additional guidance on corrosive environments, refer to AS2312 – Guide to protection of structural steel against atmospheric corrosion by the use of protective coatings.

STRUCTURAL SUPPORT

ExpressWall™ Top Hats and Intermediate Top Hats must be installed vertically, and supported by a primary structural system.

ExpressWall™ top hats can be fixed to horizontal structural steel framing which is commonly used for large walls and buildings.

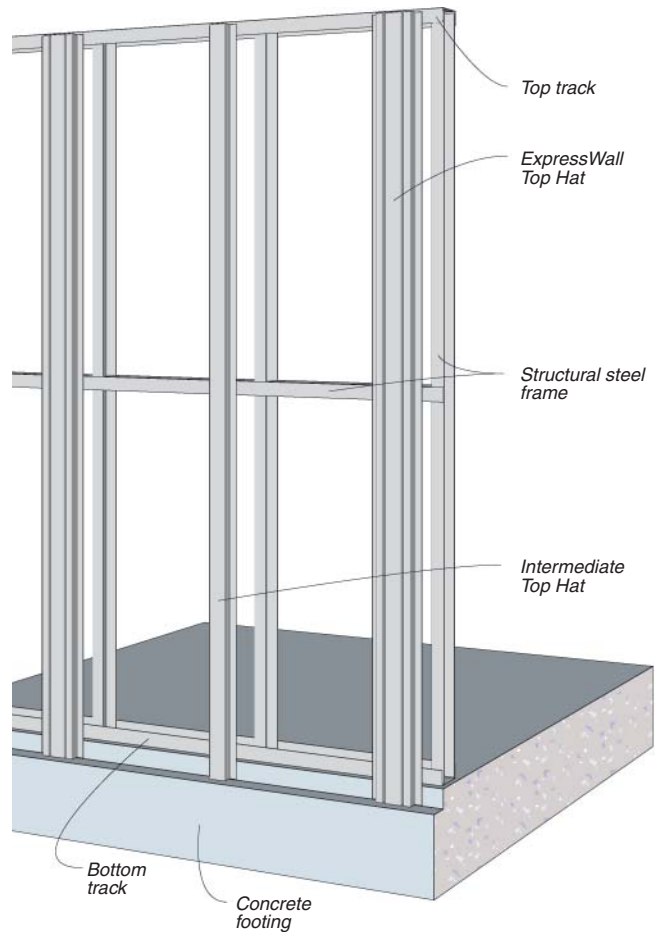
FIG 1: Fixing to Structural Steel Framing



Alternatively, ExpressWall™ framing can be fixed to appropriately designed steel or timber framing. This is commonly used for small walls and buildings. The frame must be designed to support the top hats at the top and bottom of the wall, and at cross members within the span of the wall. The connection of the cross member to the frame requires engineering design.

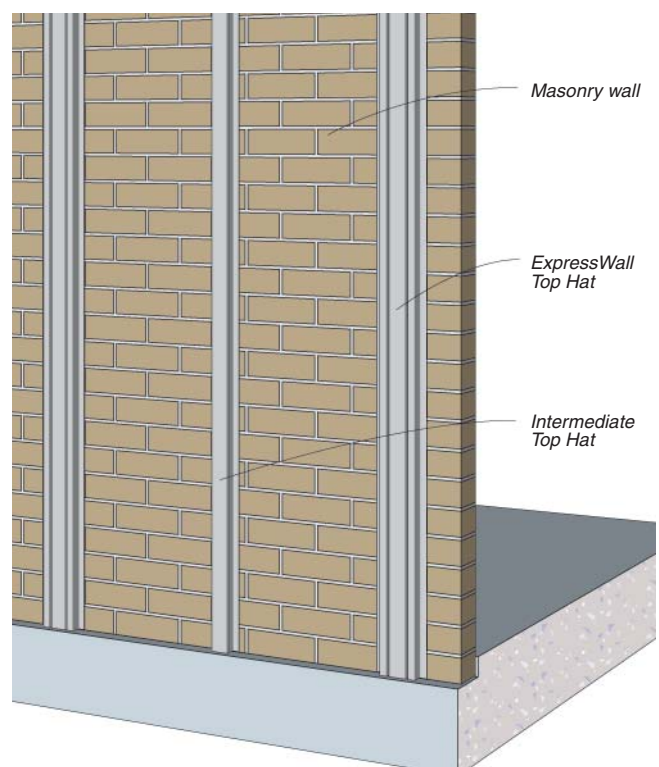
AS/NZS1170.0 Table C1 suggests that support framing be designed for a maximum deflection of $\text{span}/250$.

FIG 2: Fixing to Steel or Timber Framing



ExpressWall™ framing can also be fixed over masonry or concrete walls. All top hat connections must be designed by the project engineer.

FIG 3: Fixing to Existing Masonry Wall



PANEL LAYOUT

Panel layout for the Commercial ExpressWall™ system involves the coordination of the following:

- Aesthetic Design.
- Top Hat Spacing.
- Type of Structural Support.
- Openings – Size and Location.
- Building Size.
- ExpressPanel™ Size and Joint Width. (Horizontal joints are 10 to 20mm wide and vertical joints are 6 to 20mm wide).
- Building Control Joint Location.

Panel layout can be in a grid pattern where vertical and horizontal joints are continuous. Panels may be positioned vertically, horizontally or rotated up to 45° in the plane of the wall.

In these layouts, construction joints may be positioned behind any vertical or horizontal sheet joint. For details on control joints, refer to page 27

Panel layout can also be in a vertical or horizontal half-bond pattern where some joints are discontinuous.

FIG 4: Vertical Sheeting Aligned Grid Pattern

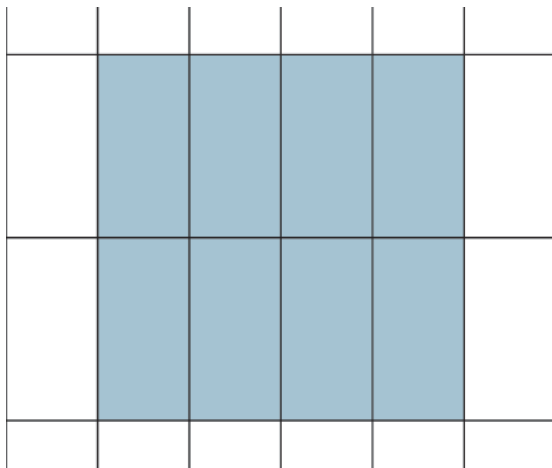


FIG 6: Vertical Sheeting Half-bond Pattern

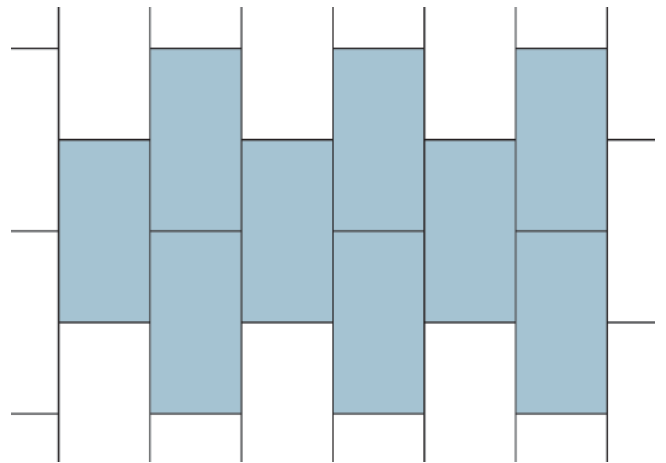


FIG 5: Horizontal Sheeting Aligned Grid Pattern

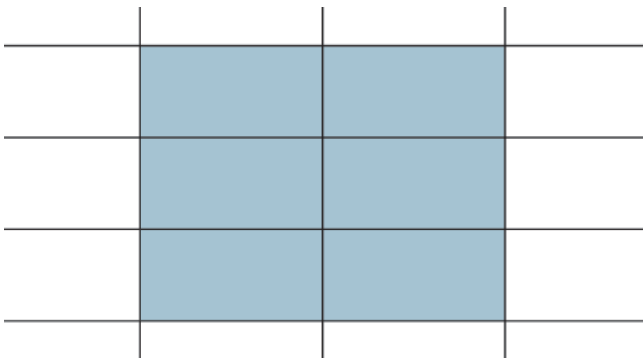
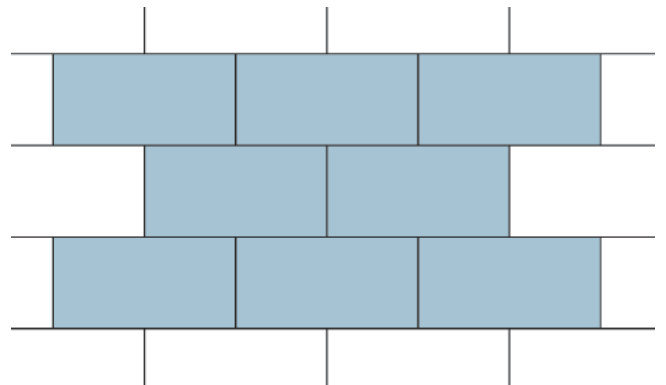


FIG 7: Horizontal Sheeting Half-bond Pattern



GASKETS

Gaskets are used at horizontal and vertical joints to maintain weather resistance.

The vertical gasket is made from EPDM rubber which has good weathering and UV resistance. It has very low compression set and water permeability.

ExpressWall™ Top Hat 1.15 has been designed to elastically deform when pressure is applied during panel fixing. ExpressWall™ Top Hat 0.75 has a recessed area to accept the gasket. These designs ensure that only the required pressure is applied to the vertical gasket.

FIG 8: Vertical Gasket Compression

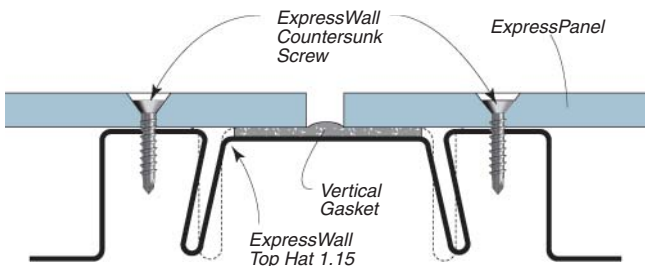
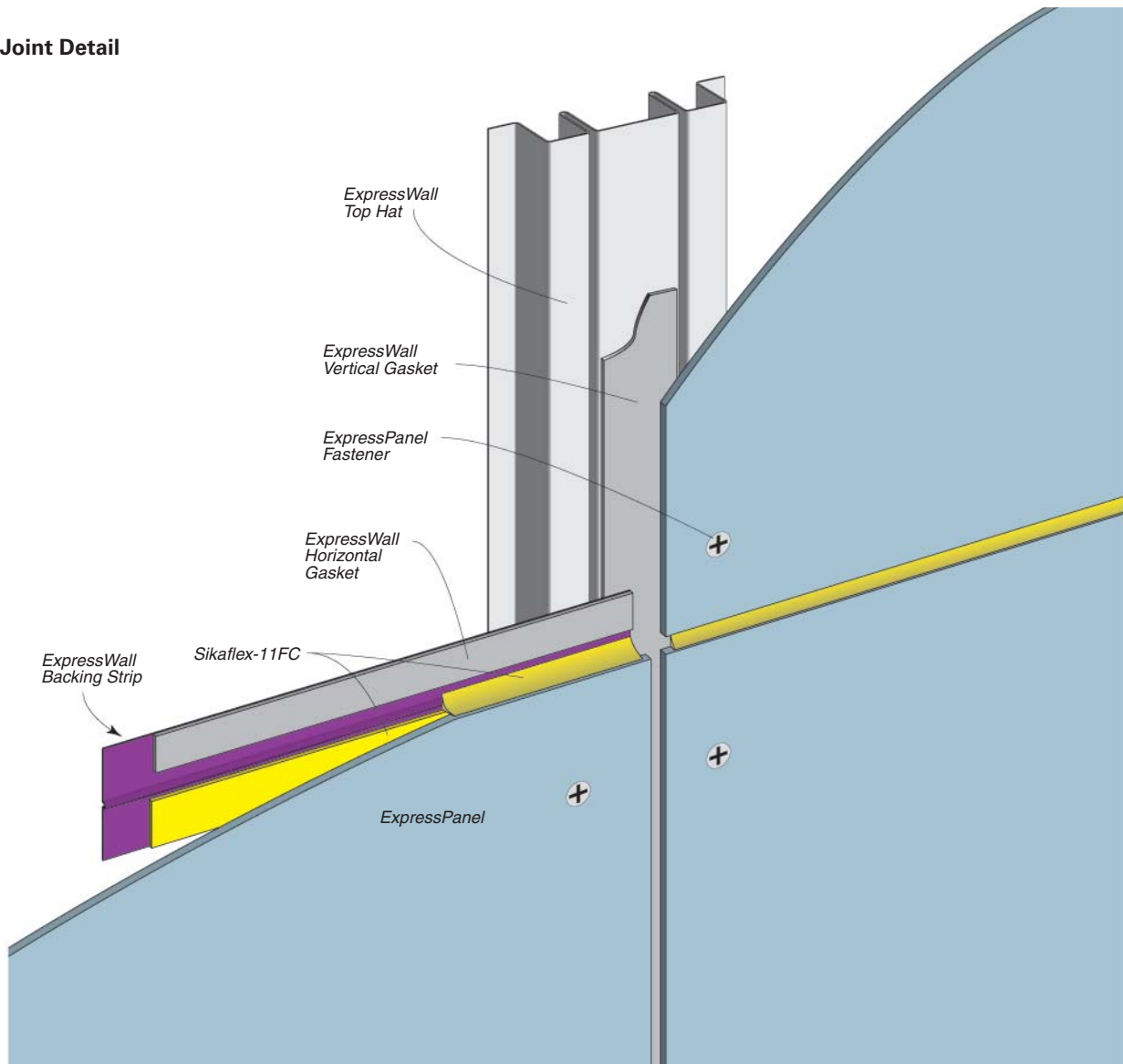
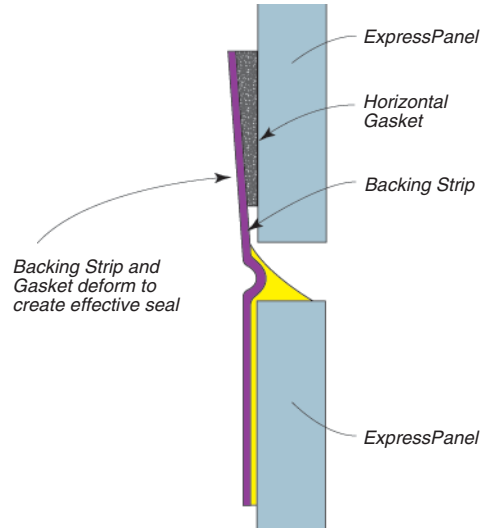


FIG 10: Joint Detail



The horizontal gasket is a closed cell PVC Nitrile foam which has a high resistance to abrasion and maintains its properties at high temperatures. It is highly conformable and has excellent resistance to water penetration.

FIG 9: Horizontal Gasket Compression



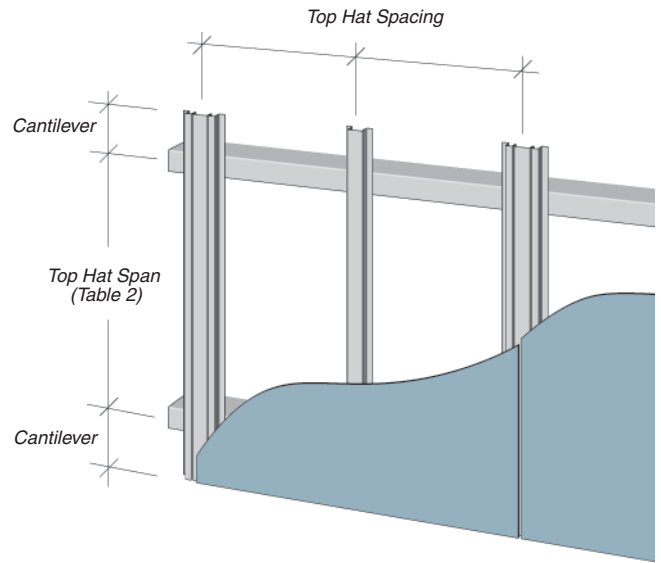
TOP HAT FRAMING

The design capacities of the Commercial ExpressWall™ system are in limit state format and intended for use with AS/NZS1170.2. The system is suitable for cyclonic wind zones, Region C and D, and has been tested in accordance with AS4040.3 1992.

To obtain equivalent permissible load capacity divide the 'Ultimate Wind Capacities' in Table 2 or Table 3 by 1.5.

The top hat capacities in Table 2 and Table 3 have been calculated in accordance with AS4600 : Cold Formed Steel Structures and are applicable for 0.75 and 1.15 BMT ExpressWall™ Top Hats and for 1.15 BMT Intermediate Top Hats. The deflection of the top hats as detailed in Table 2 and Table 3 is no more than span/250 when subjected to serviceability wind loads of 68% of ultimate wind loads.

FIG 11: Single Span Installation



Maximum Cantilever = 0.2 x Adjacent Top Hat Span

TABLE 2: Ultimate Wind Capacity (Refer to FIG 11)

Single Span Installation

Top Hat Span (mm)	Nominal Top Hat Spacing*	
	450mm	600mm
	Ultimate Wind Capacity (kPa)	Ultimate Wind Capacity (kPa)
900	6.00	3.50
950	6.00	3.50
1000	5.41	3.50
1100	4.14	3.14
1200	3.18	2.41
1300	2.42	1.83
1400	1.87	1.42
1500	1.48	1.12
1600	1.19	0.91
1700	0.98	0.74
1800	0.81	0.62
1900	0.69	0.52
2000	0.58	0.44
2100	0.50	0.38
2200	0.44	0.33

* Nominal top hat spacings of 450mm and 600mm are suitable for actual spacings of up to 460mm and 610mm respectively. For panels fixed to a minimum of three top hats, with top hat spacing of 400mm nominal (410mm max.), and with single or double top hat span of up to 900mm, the ultimate wind capacity is 7.0kPa.

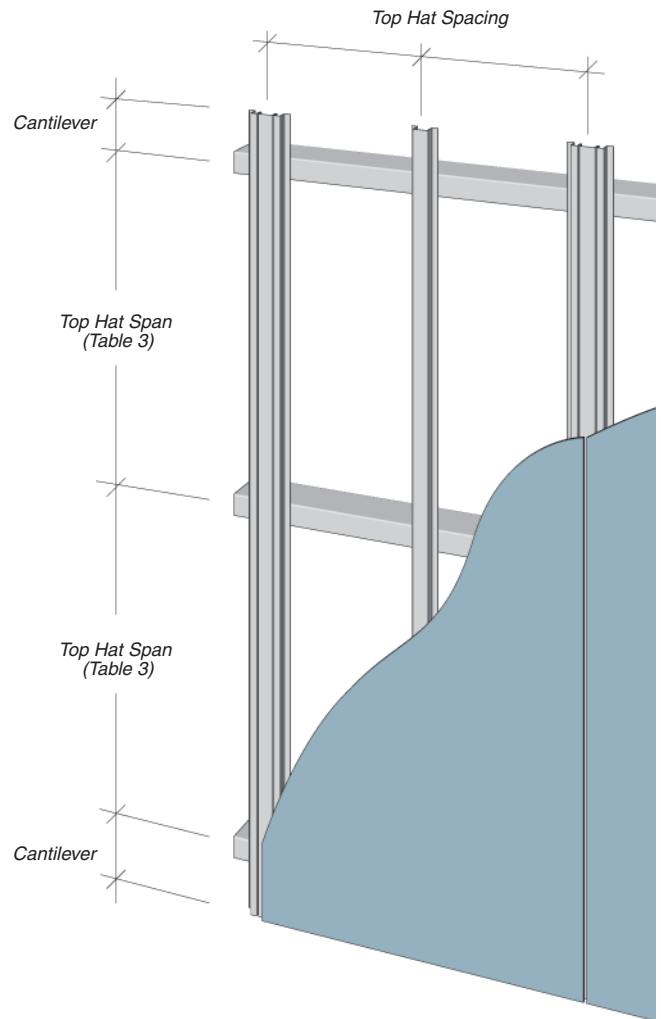
**TABLE 3: Ultimate Wind Capacity
(Refer to FIG 12)**

Double Span Installation

Top Hat Span (mm)	Nominal Top Hat Spacing*	
	450mm	600mm
	Ultimate Wind Capacity (kPa)	Ultimate Wind Capacity (kPa)
900	6.00	3.50
950	6.00	3.50
1000	6.00	3.50
1100	5.84	3.50
1200	4.91	3.50
1300	4.18	3.17
1400	3.60	2.73
1500	3.14	2.38
1600	2.76	2.09
1700	2.44	1.85
1800	2.13	1.62
1900	1.77	1.34
2000	1.49	1.13
2100	1.26	0.96
2200	1.08	0.82

* Nominal top hat spacings of 450mm and 600mm are suitable for actual spacings of up to 460mm and 610mm respectively. For panels fixed to a minimum of three top hats, with top hat spacing of 400mm nominal (410mm max.), and with single or double top hat span of up to 900mm, the ultimate wind capacity is 7.0kPa.

FIG 12: Double Span Installation



If adjacent spans differ by more than 25% then single span values must be adopted.

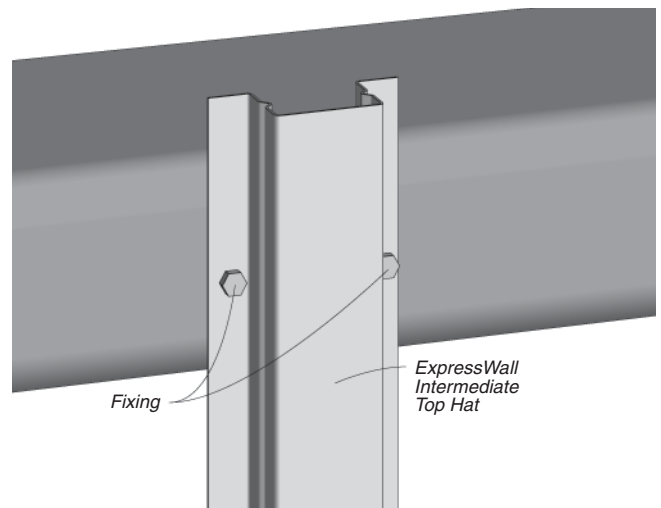
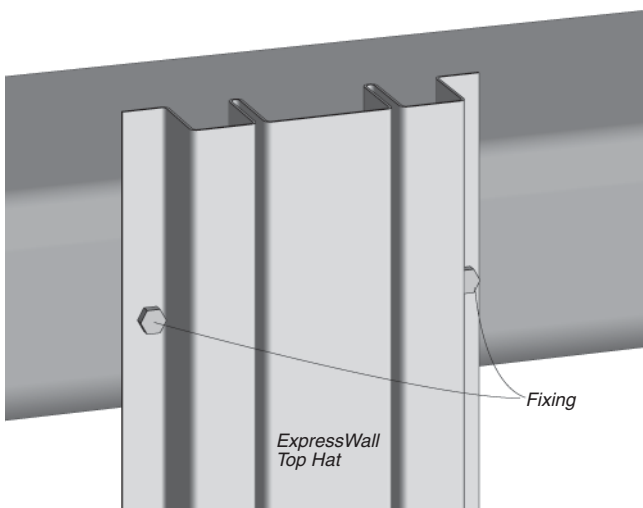
$$\text{Maximum Cantilever} = 0.2 \times \text{Adjacent Top Hat Span}$$

TOP HAT FIXING

(Refer to FIG 13)

NOTE: It is the responsibility of the project engineer to specify the connection of the top hats to the support structure.

FIG 13: Top Hat Fixing



PANEL PREPARATION

ExpressPanel™ preparation is a three step process.

Step 1 – Pre-drill holes for screws.

Step 2 – Affix backing strips and allow adhesive to set.

Step 3 – Affix horizontal gasket to backing strips.

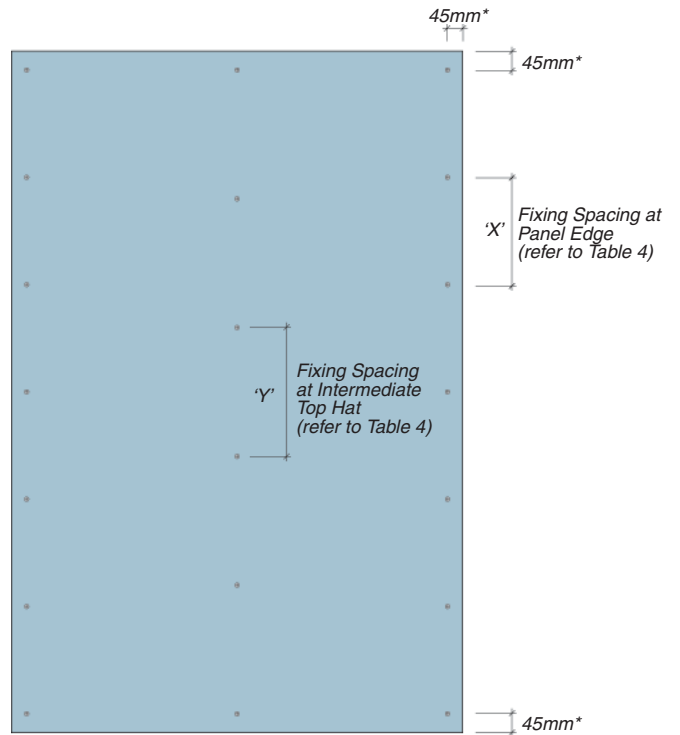
These steps may be performed off-site prior to installation.

PANEL FIXING SET-OUT

ExpressPanel™ must be fixed in accordance with Table 4. Appropriate panel fixing layout should be selected for the project Design Wind Pressure, Top Hat Spacing and Panel Fixing Type. (Refer to FIG 15 and 16).

For curved façades, please refer to page 22.

FIG 14: Panel Fixing Set-out



* Minimum distance of fastener to edge of 35mm.

Table 4: Panel Fixing Requirements

Design Wind Pressure (Ultimate) (kPa)	Max. Top Hat Spacing (mm)		Max. Fixing Spacing (mm)	
	Panel Fixed to Two Top Hats See FIG 15.	Panel Fixed to Three or more Top Hats See FIG 16.	at Panel Edge 'X' (mm)	at Intermediate Top Hat 'Y' (mm)
1.0	600	600	600	600
1.5	450	600	600	600
2.0	450	600	400	400
2.5	450	600	400	350
3.0	450	600	400	300
3.0	450	450	400	400
3.5	400	600	300	250
3.5	400	450	350	350
4.0	400	450	300	300
4.5	400	450	300	250
5.0	300	450	300	200
5.5	300	450	250	200
6.0	300	450	250	200
6.5	300	400	250	200
7.0	300	400	250	200

FIG 15: Panel Fixed to Two Top Hats Only

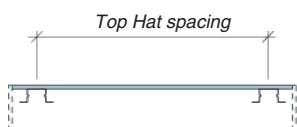


FIG 16: Panel Fixed to Three or More Top Hats



PRE-DRILLING HOLES

Holes for screws must be pre-drilled. Use the recommended counter sinking tool for countersunk head screws, and a 6mm masonry bit for exposed head screws. Holes must be 6.2mm to 6.3mm in diameter. Do not use hammer action when drilling. Clean dust out of holes.

FIG 17: Fastener Pre-drilling for Countersunk Head Screws



NOTE: Use only the recommended tool as supplied by CSR. The use of other tools for this purpose may reduce fixing capacity or reduce the weather resistance of the system.

HINT: One way of drilling holes is to drill the top sheet of a pack with the counter sinking drill set to approximately 12mm depth. This will give a starter hole on the sheet below, saving on set out time.

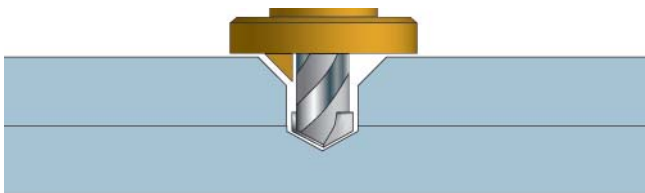
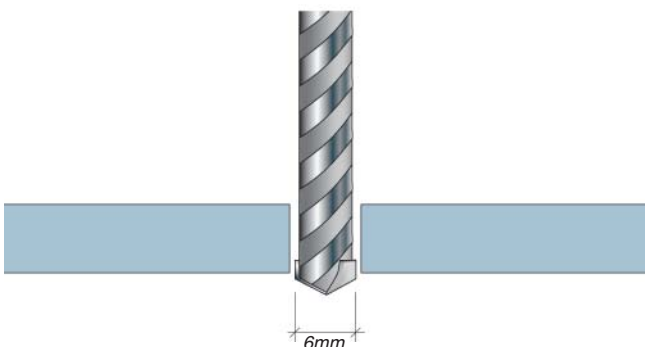


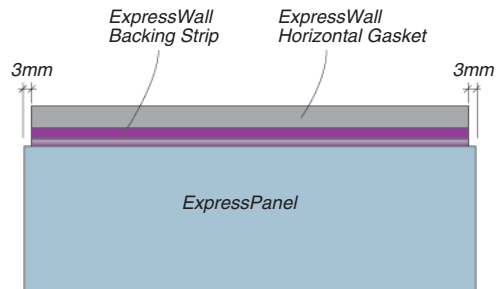
FIG 18: 6mm Masonry Drill for Exposed Head Screws



BACKING STRIP FIXING

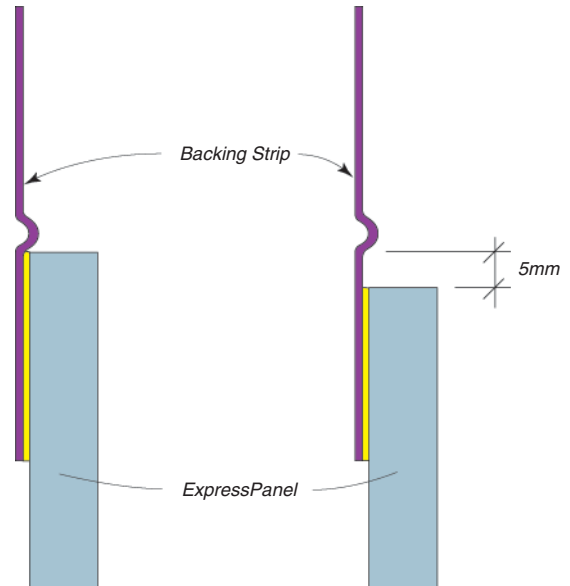
Backing strip is installed behind all horizontal panel joints. Backing strip is to be 6mm shorter overall than the width of the ExpressPanel™ (cut to length if necessary) and adhered to the back of the panel (along the top edge) with Sikaflex-11FC.

FIG 19: Backing Strip Positioning



For 10mm Horizontal Joint

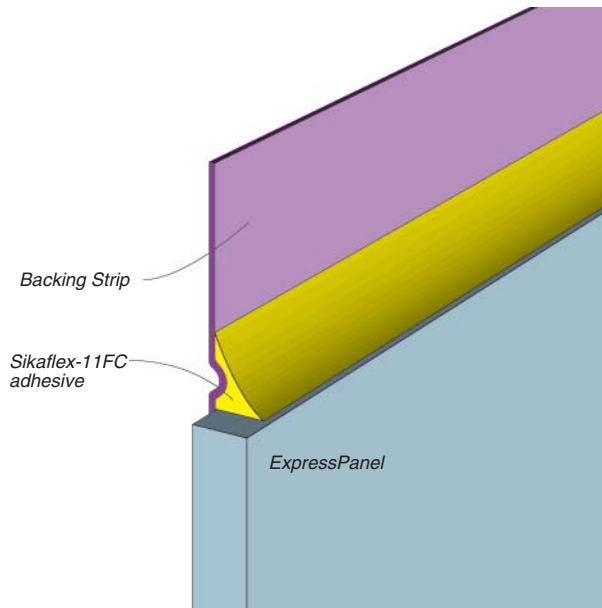
For 20mm Horizontal Joint



Backing strip is adhered to the back of panels with a continuous bead of Sikaflex-11FC. The bead must be a suitable size so that when pressed flat, adhesive fully covers the interface between the backing strip and the ExpressPanel™. The adhesive must be allowed to cure before the panel is installed.

A fillet of Sikaflex-11FC is then placed along the top edge of the panel. Refer to FIG 20. This ensures that the joint drains and that salt and dirt will not build up at the joint.

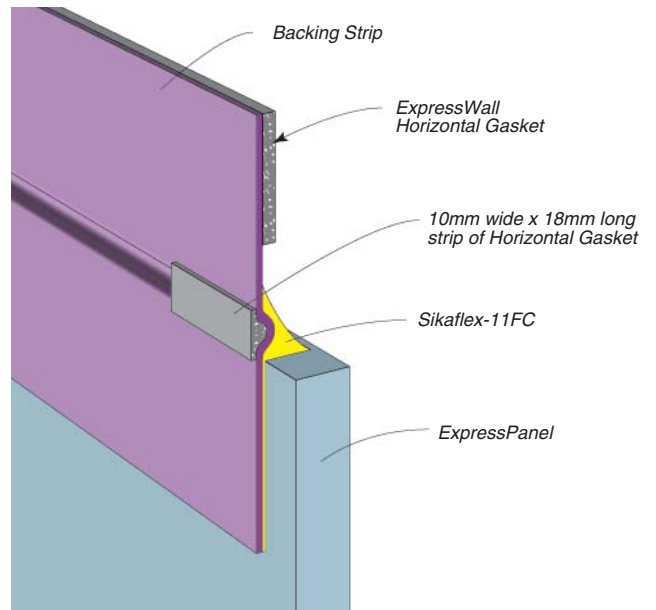
FIG 20: Horizontal joint



SEALING ENDS OF BACKING STRIP

To seal the groove in the backing strip at the ends, apply a small section of gasket to the rear of the backing strip. This will be forced into the recess and seal the end of the strip. Alternatively use Sikaflex-11FC to fill the groove.

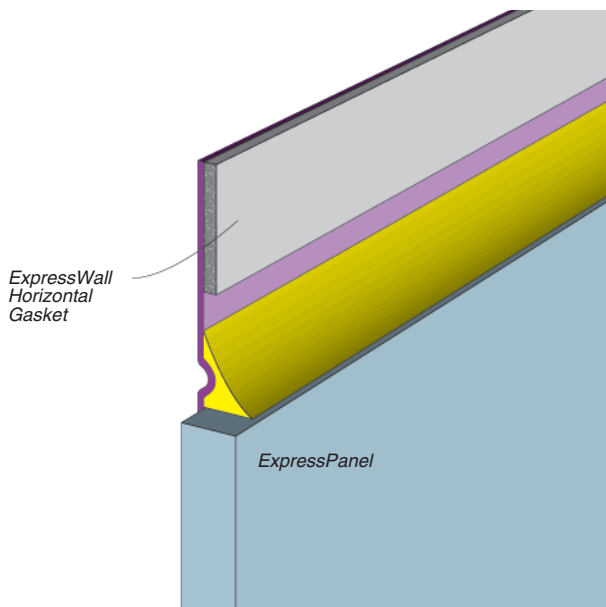
FIG 22: Sealing Ends of Backing Strip



HORIZONTAL GASKET FIXING

Apply the ExpressWall™ Horizontal Gasket to the upper section of the backing strip, keeping the gasket in line with the top of the backing strip. (Alternatively, this can be done prior to fixing the backing strip to the panel).

FIG 21: Horizontal Gasket Installation



PANEL INSTALLATION

ExpressPanel™ must be in a dry condition when fixed. If panels become wet after installation, allow to dry before covering screw heads.

Panels must only be fixed using Cemintel ExpressWall™ Screws.

Installing ExpressPanel is a three step process:

1. Install Vertical Gaskets to ExpressWall™ Top Hats.
2. Screw fix ExpressPanel™ to top hats.
3. Cover fastener heads (when using countersunk head screws).

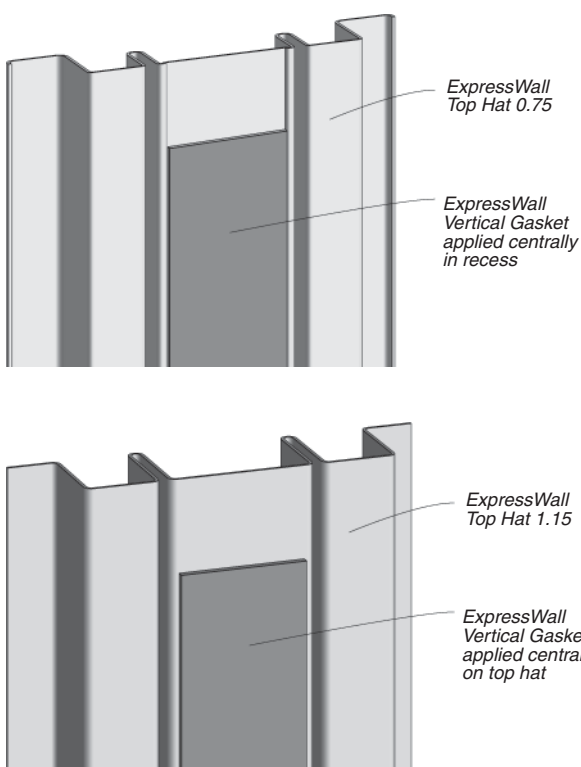
CSR recommends the use of torque control screw guns.

If it is necessary to remove and replace a panel, avoid reusing screw holes in the top hats by adjusting fixing locations in the panel.

INSTALLING VERTICAL GASKET

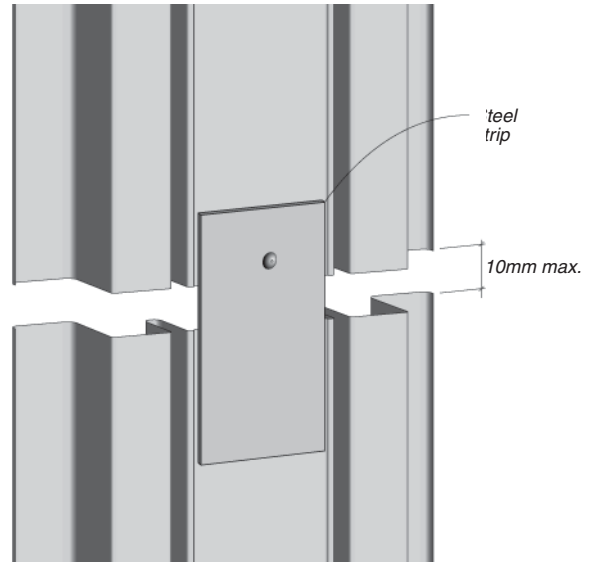
Install vertical gasket to central section of the ExpressWall™ Top Hat for the full extent of panels. Be careful not to stretch the gasket when installing. When joining gasket, cut ends cleanly and push together before adhering.

FIG 23: Vertical Gasket Installation



When top hat is discontinuous, butt ends together tightly and continue gasket over the joint. If a gap is present, install a steel strip to support the gasket.

FIG 24: Gasket Support at Discontinuous Joint (0.75 Top Hat shown)



FIXING PANELS USING COUNTERSUNK HEAD FASTENERS

Drive the countersunk head screw into the top hat using an electric screw gun. CSR recommends the use of a screw gun with torque control to prevent overdriving of screws.

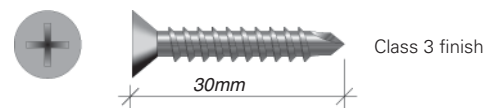
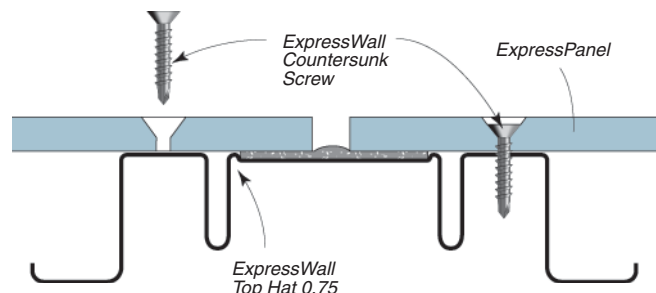


FIG 25: Fixing with Countersunk Screws to Top Hat 0.75

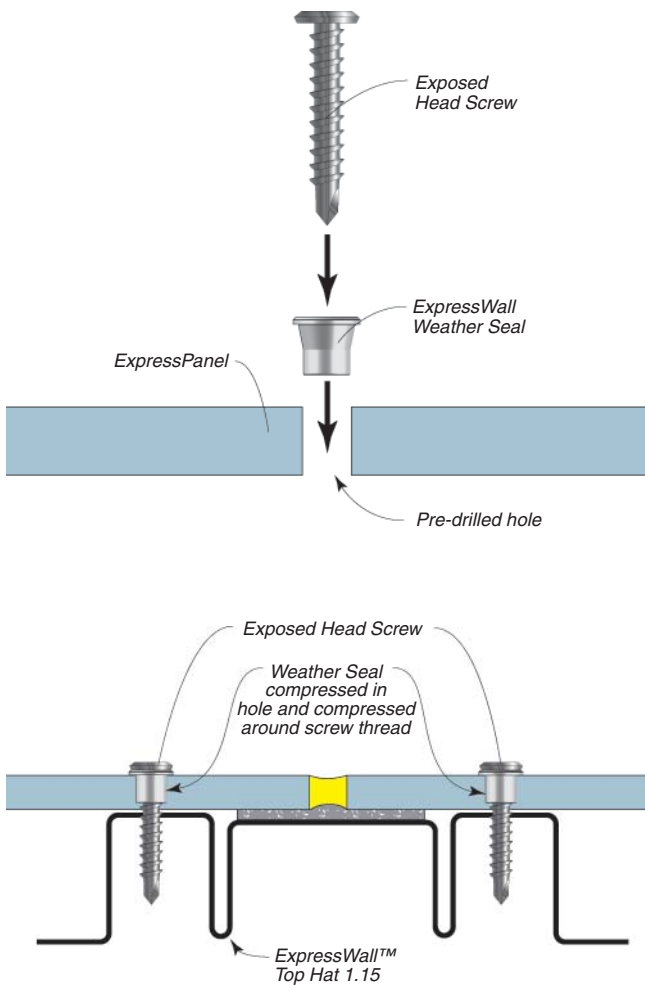


PANEL FIXING USING EXPOSED HEAD FASTENERS

Install the ExpressWall™ Weather Seal into the pre-drilled hole in the ExpressPanel™. Drive the exposed head screw through the weather seal and into the top hat using an electric screw gun. CSR recommends the use of a screw gun with torque control to prevent overdriving of screws

Exposed head screws can only be used with 1.15 BMT top hats.

FIG 26: Fixing with Exposed Head Screws



JOINTS

ExpressPanel™ is generally installed with a nominal 10mm width, horizontal and vertical expressed joints between adjacent panels. Joints up to 20mm nominal width can be formed, provided additional care is taken during installation to ensure that panel edges cover the joint gaskets by a minimum of 10mm.

FIG 27: Vertical Joint Detail

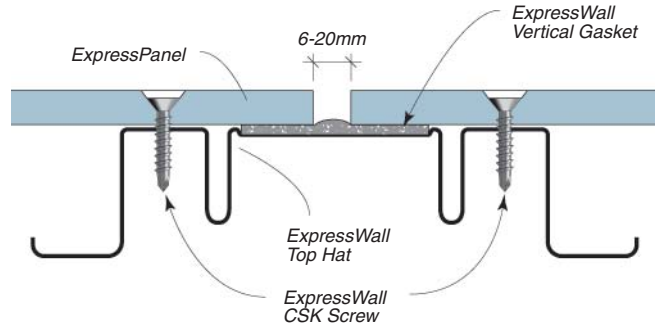


FIG 28: 10mm Horizontal Joint Detail

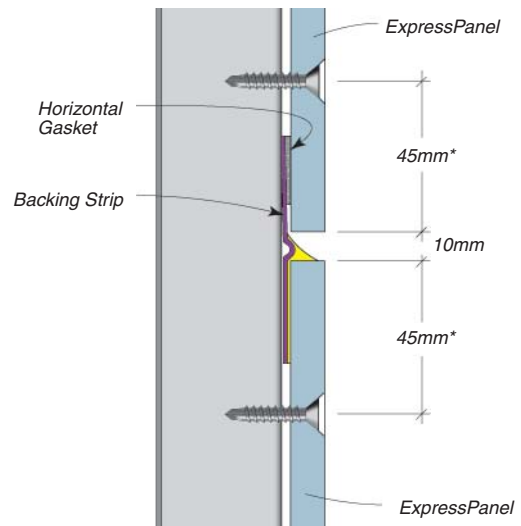
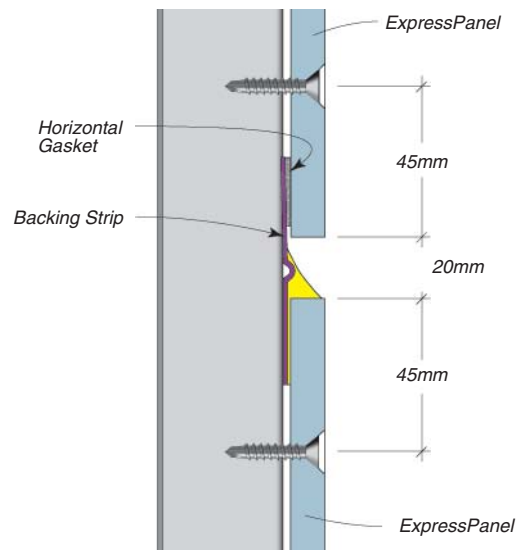


FIG 29: 20mm Horizontal Joint Detail



* Minimum distance of fastener to edge of 35mm.

For Commercial ExpressWall™ systems subjected to design wind pressure in excess of 4.0kPa, or in corrosive environments as detailed in Table 1, all horizontal and vertical joints must be filled with recommended joint sealant. Sealant is also required where pre-painted panels are used. Sealant must be installed in accordance with the manufacturer's instructions.

FIG 30: Sealed Vertical Joint Detail

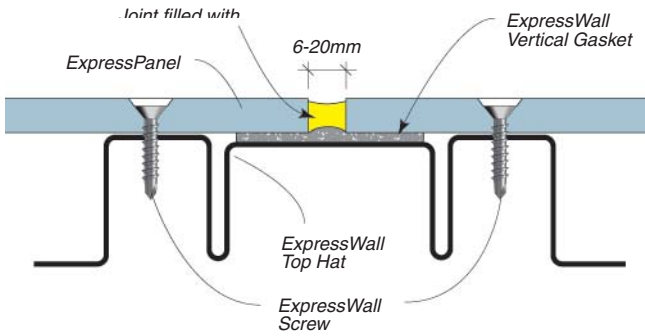
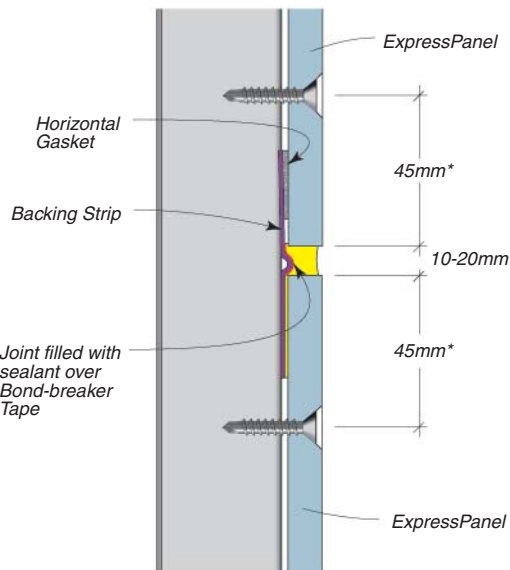


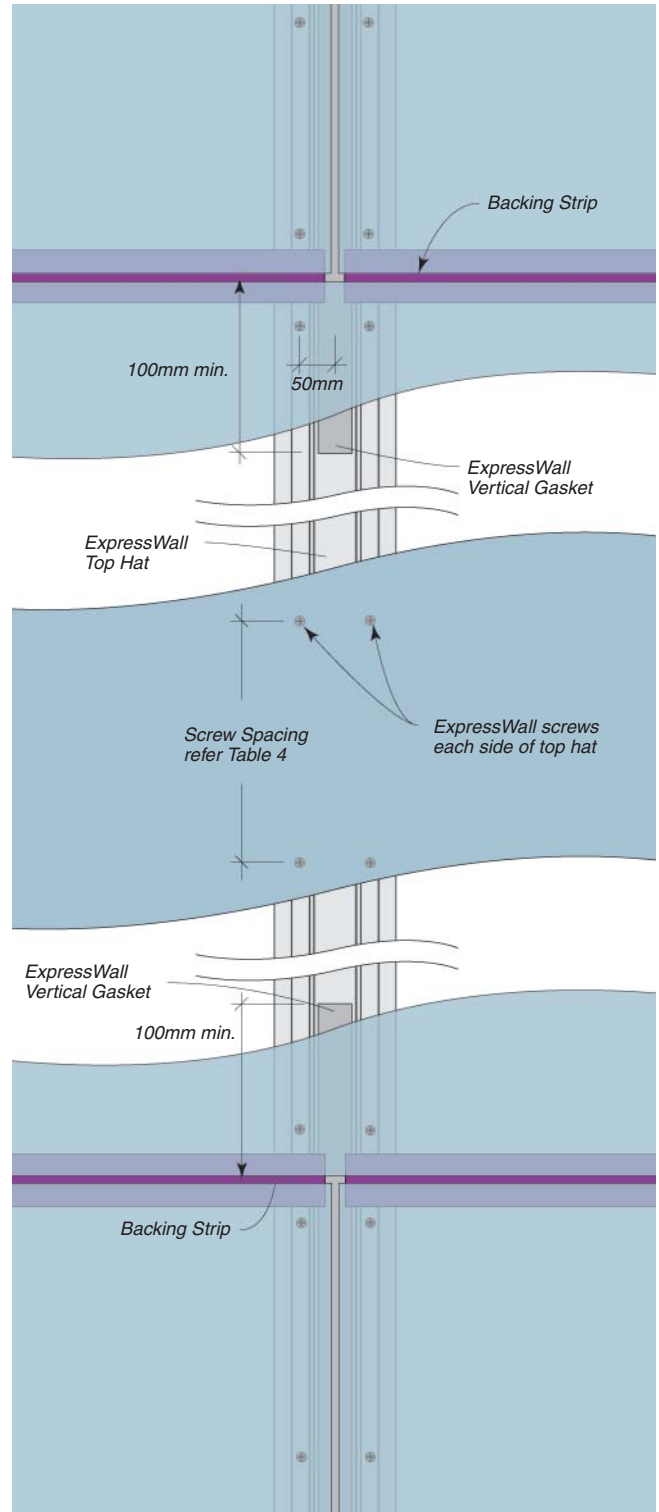
FIG 31: Sealed Horizontal Joint Detail



* Minimum distance of fastener to edge of 35mm.

At the beginning and end of a vertical joint, such as with sheets installed in a half-bond pattern, continue the vertical gasket past the horizontal joint by 100mm minimum. Refer to FIG 32.

FIG 32: Vertical Gasket and Fixing Detail for Half-bond Panel Layout



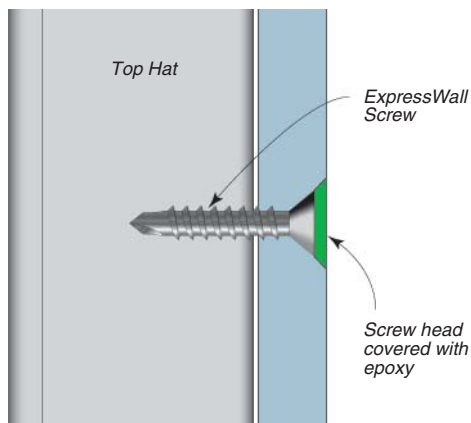
SCREW HEAD COVERING FOR COUNTERSUNK SCREWS

All countersunk screw heads must be covered with epoxy compound and flush finished with the ExpressPanel™ face.

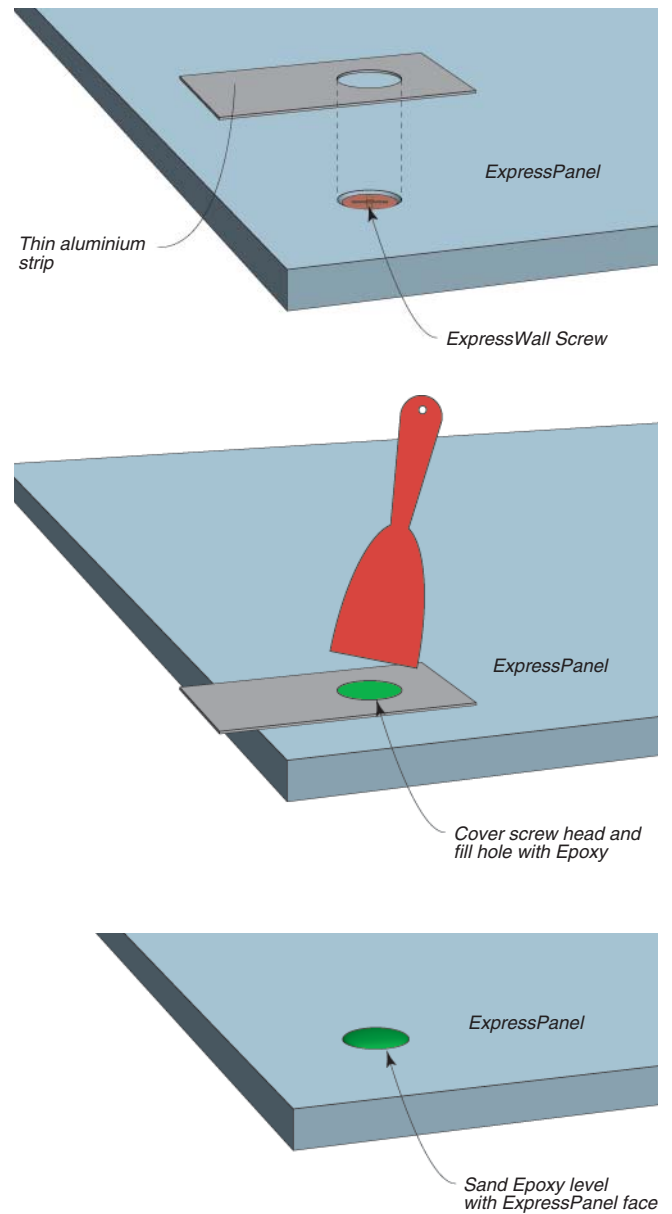
Epoxy shall be installed in the following manner:

- Mix epoxy accurately in accordance with the packaging/manufacturer's instructions.
- Immediately use mixed epoxy.
- Slightly overfill holes and level off before epoxy fully cures.
- When cured, sand epoxy level with ExpressPanel™ face.
- A thin layer of Cemintel™ External Joint Compound may be used to achieve a flush finish.

FIG 33: Epoxy Covering of Screw Heads



HINT: One way of applying epoxy is through a 20mm hole in an aluminum sheet. This will minimise spill-over and allow for some shrink back of the epoxy without having to repeat the application.



CURVED FAÇADES

Where there is an architectural requirement for a curved façade, this can be achieved in three ways.

For radii less than 2m, CSR recommends the use of pre-fabricated glass reinforced cement (GRC) fixed and finished in accordance with the manufacturer's specification.

For radii between 2m and 10m, use 2 x 4.5mm Cemintel™ compressed sheets, laminated together insitu.

For radii greater than 10m, use 9mm ExpressPanel™ fixed to framing.

In general framing must be set-out on a true curve to enhance appearance and not locally overstress the panels.

For curved façades greater than 2m radius, framing shall be installed in accordance with Table 5.

CURVED PANEL INSTALLATION

Curved 9mm ExpressPanel™ can be fixed in accordance with the panel fixing section of this manual.

Laminated 4.5mm Cemintel™ Compressed Sheet shall be installed as follows

- Install top hats at spacing as per Table 5.
- Adhere backing strip to the first layer sheets and allow sealant to cure.
- Fix first layer of fibre cement with enough screws to form the shape and hold panel in position. Use countersunk screws.
- Apply epoxy adhesive to entire panel (with notched trowel) and immediately install second layer.
- Install enough wafer head screws to fully laminate the two panels.
- After the epoxy has been allowed to cure, remove wafer head screws, countersink holes and install ExpressWall™ Screws as per Table 4.

TABLE 5: Curved Wall Framing and Façade Panel

Curve Radii (m)	Panel Type	Top Hat Spacing (mm)	
		Panel Width 900mm	Panel Width 1200mm or Greater
2m-5m	2 x 4.5mm Cemintel™ Compressed Fibre Cement	300	300
5m-10m	2 x 4.5mm Cemintel™ Compressed Fibre Cement	300	400
10m-15m	1 x 9mm Cemintel ExpressPanel™	300*	400*
>15m	1 x 9mm Cemintel ExpressPanel™	450	As per Table 4

* Provide 2 additional fixings per metre to each top hat.

CONSTRUCTION DETAILS

FIG 34: Deflection Head with Exposed Joint

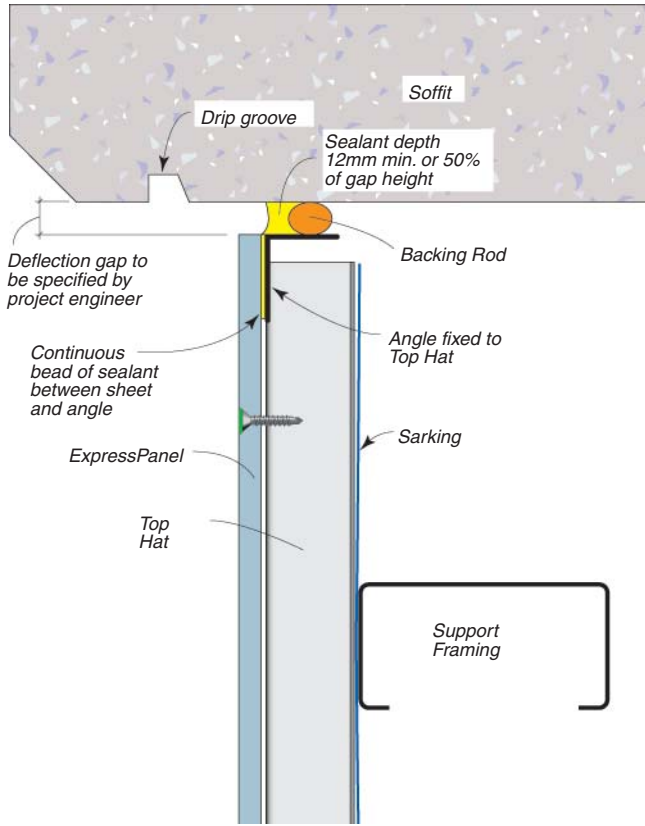
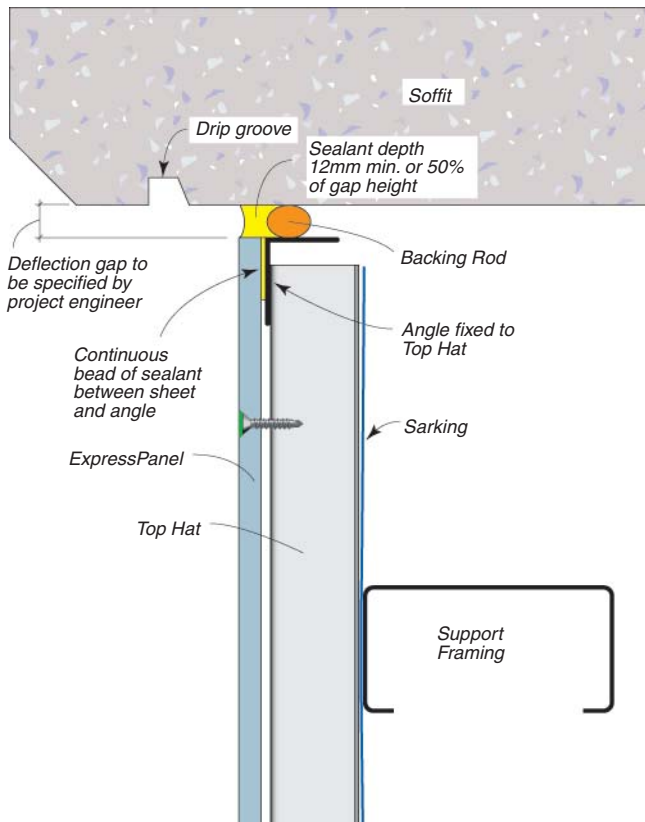


FIG 35: Deflection Head with Filled Joint



WALL FLASHINGS

In general, flashings shall be designed and installed in accordance with SAA – HB39 1997 – Installation Code for Metal Roofing and Wall Cladding. Stop ends shall be incorporated with all flashings. All flashings are supplied by others.

TABLE 6: Flashing Upstand

Ultimate Design Wind Pressure (kPa)	Flashing Upstand Minimum (mm)
2.5	150
3.5	200
4.0	250
5.0	300
6.0	350
7.0	400

FIG 36: Base Detail for Inline Slab

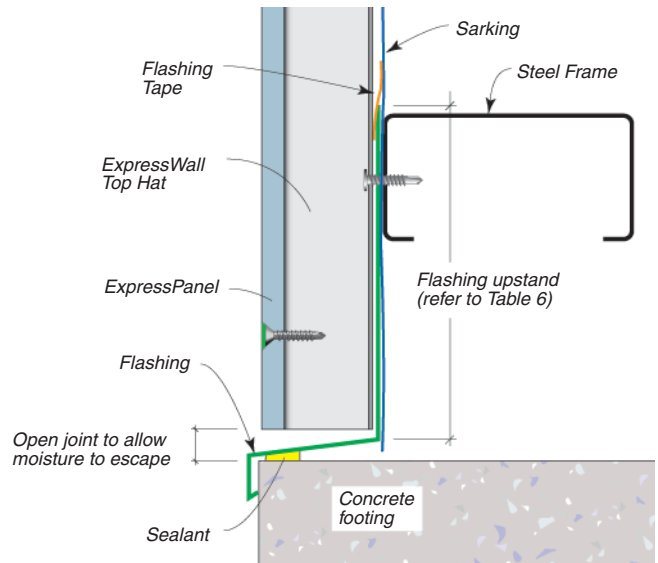


FIG 37: Base Detail Corrosivity Category D - Inline Slab

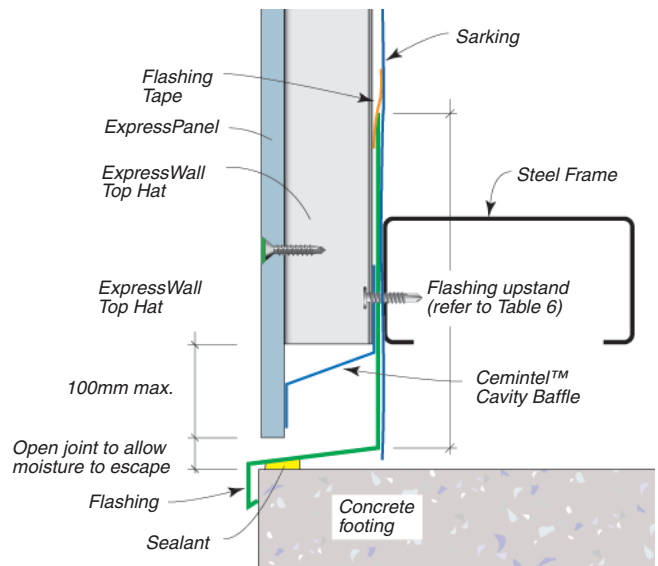


FIG 38: Framed Soffit Detail

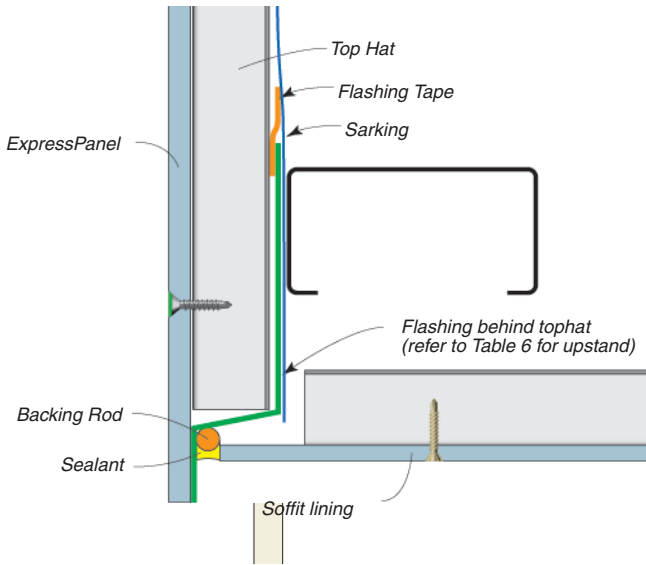


FIG 40: Abutment Detail – Option 2

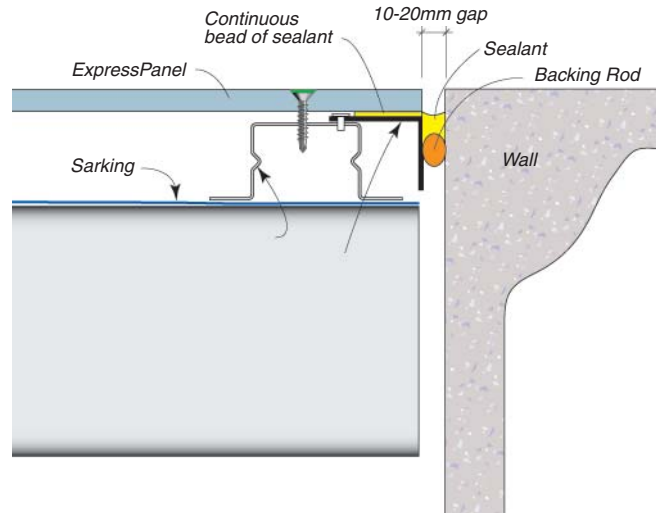


FIG 39: Abutment Detail – Option 1

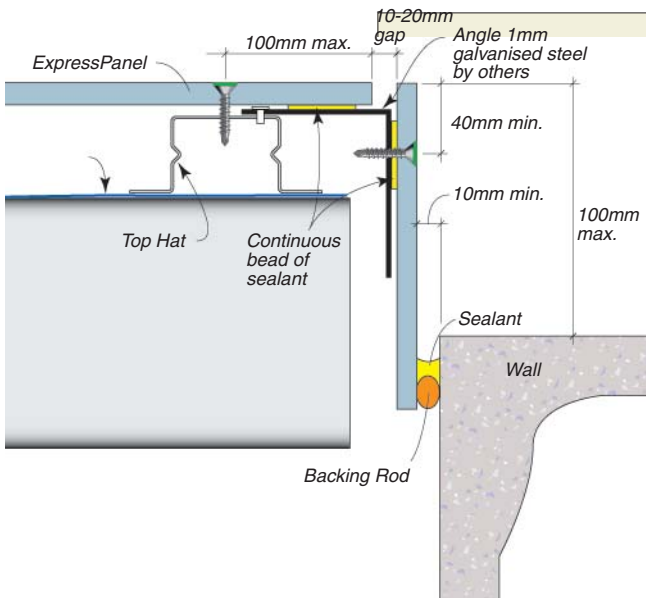


FIG 41: Abutment Detail – Option 3

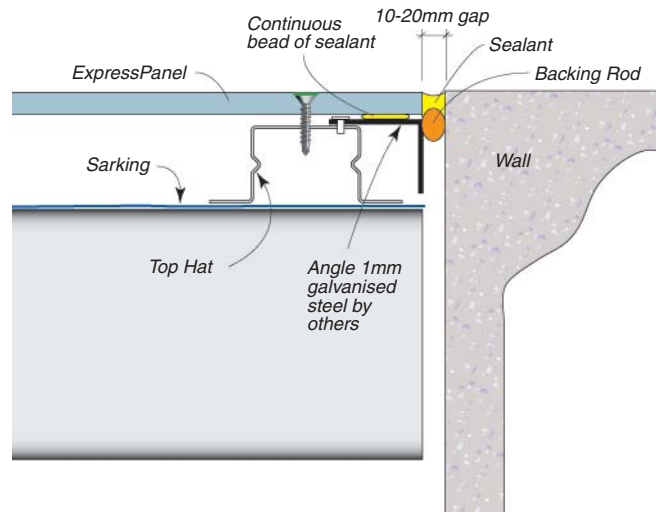


FIG 42: Internal Corner Detail

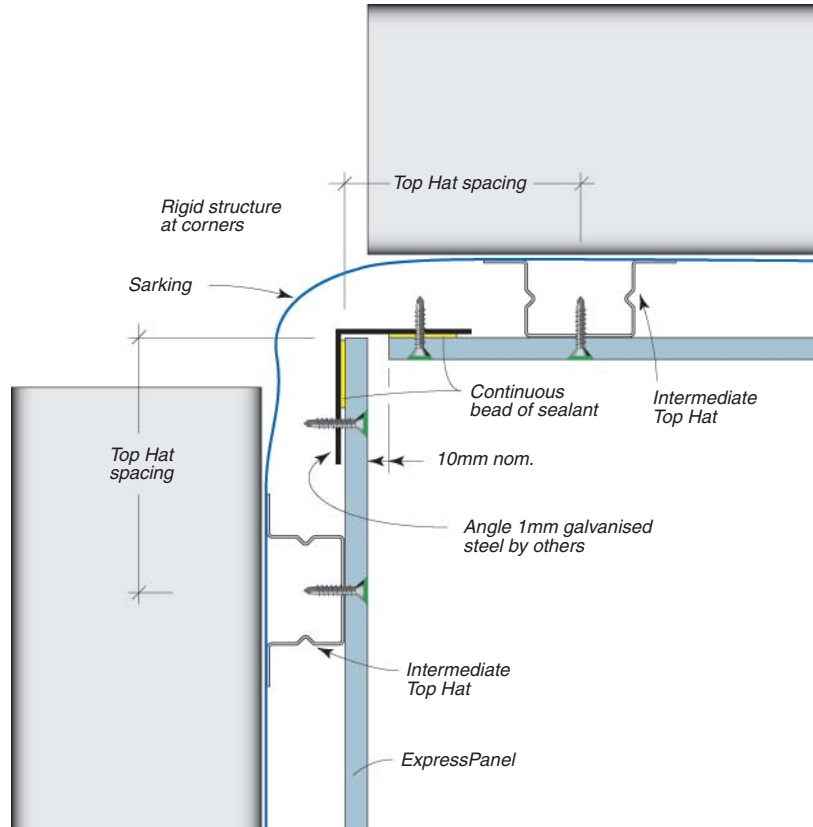


FIG 43: External Corner Detail

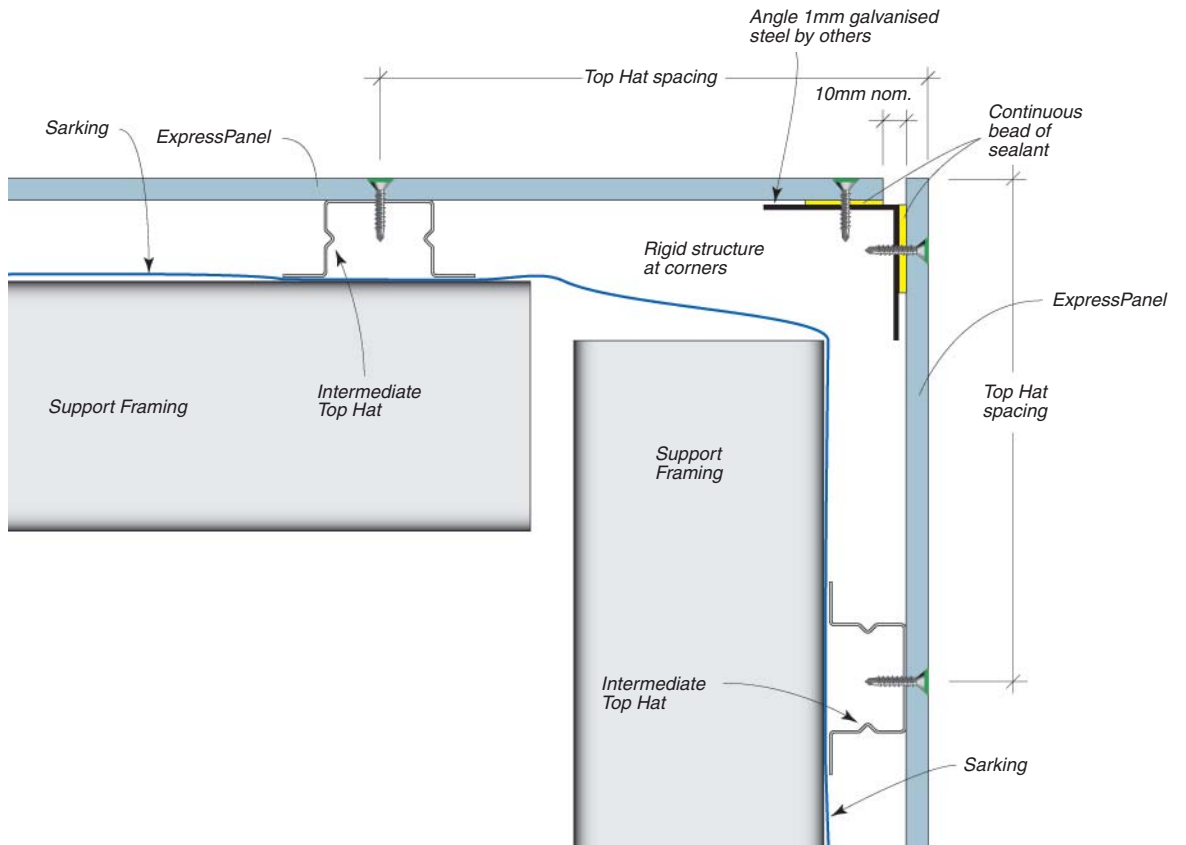


FIG 44: Curved Corner Detail

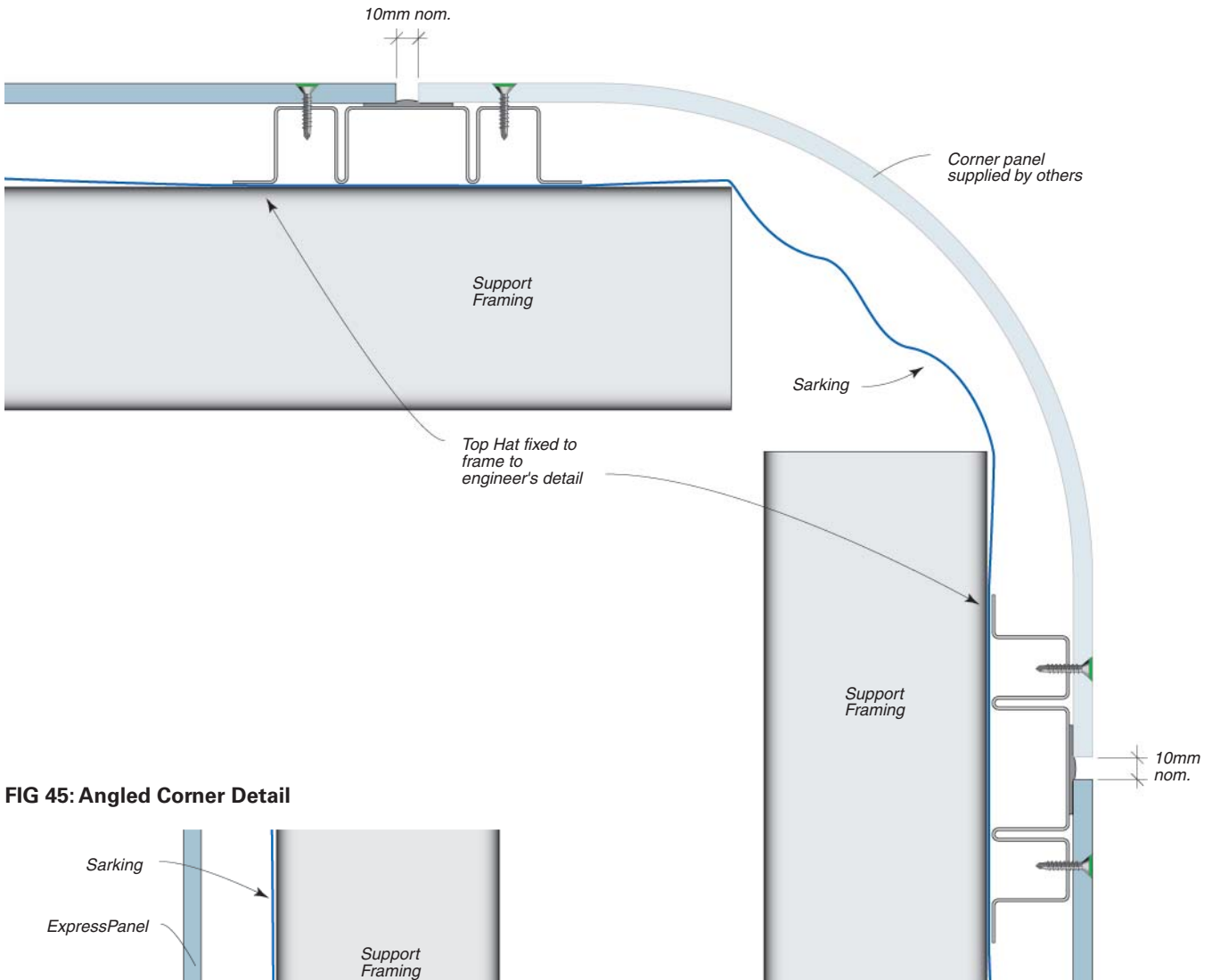


FIG 45: Angled Corner Detail

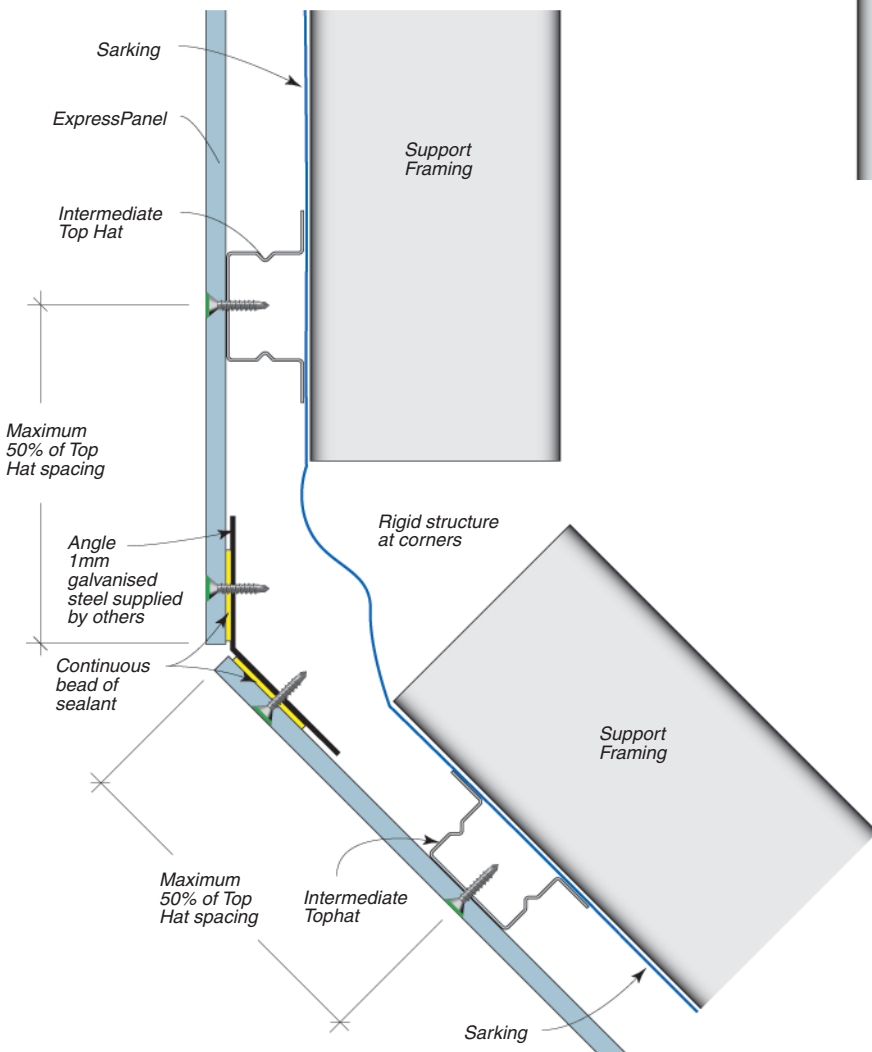


FIG 46: Capping Detail – Option 1

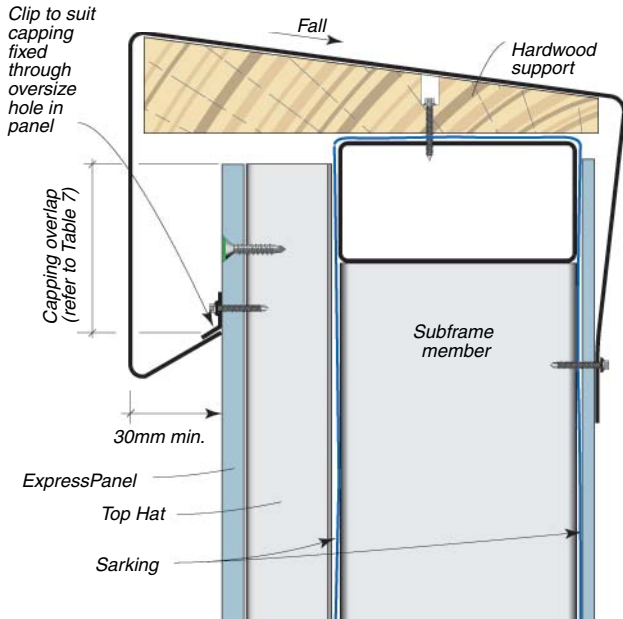
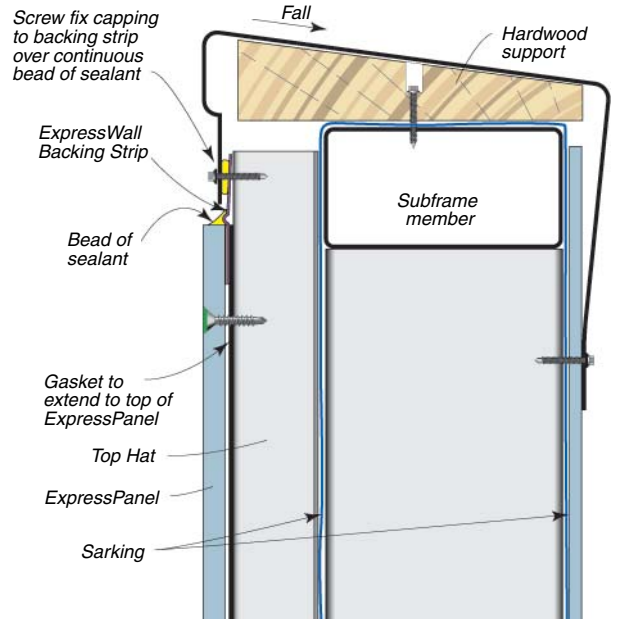


FIG 47: Capping Detail – Option 2



Parapet capping shall be designed and fastened in accordance with SAA – HB39 1997 – Installation Code for Metal Roofing and Wall Cladding. Stop ends shall be incorporated to all flashings.

TABLE 7: Capping Overlap

Ultimate Design Wind Pressure (kPa)	Minimum Capping Overlap (mm)
1.5	50
3.5	100
5.0	150
7.0	200

FIG 48: Horizontal Control Joint

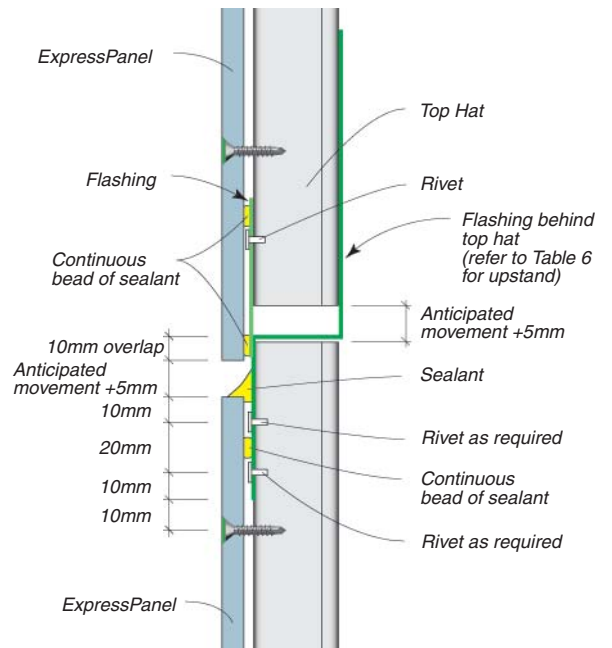


FIG 49: Vertical Control Joint

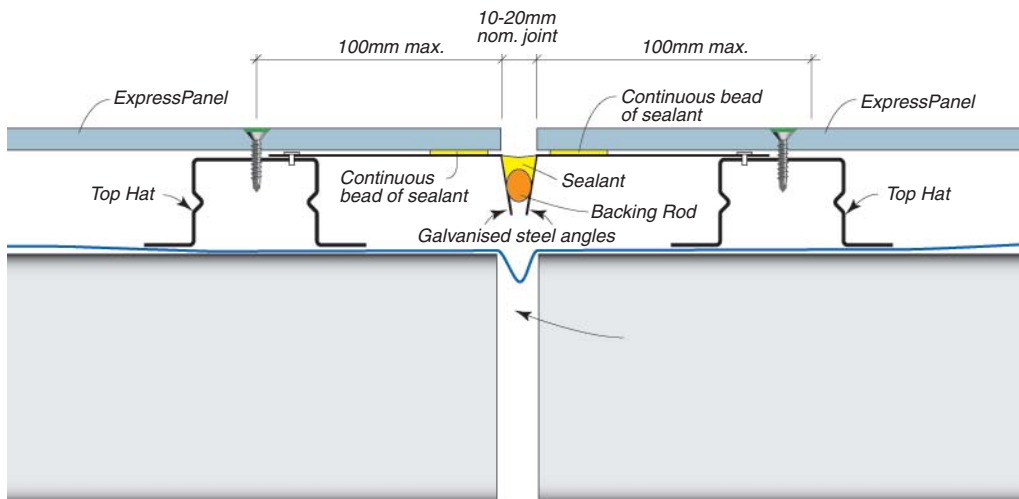


FIG 50: Window Head Detail

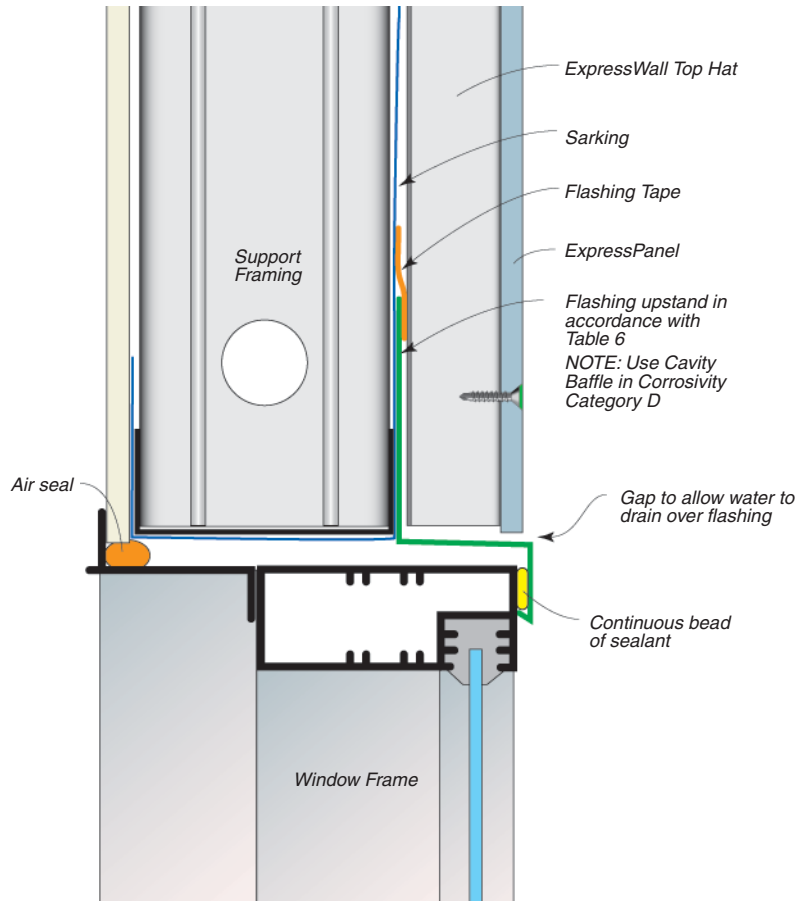
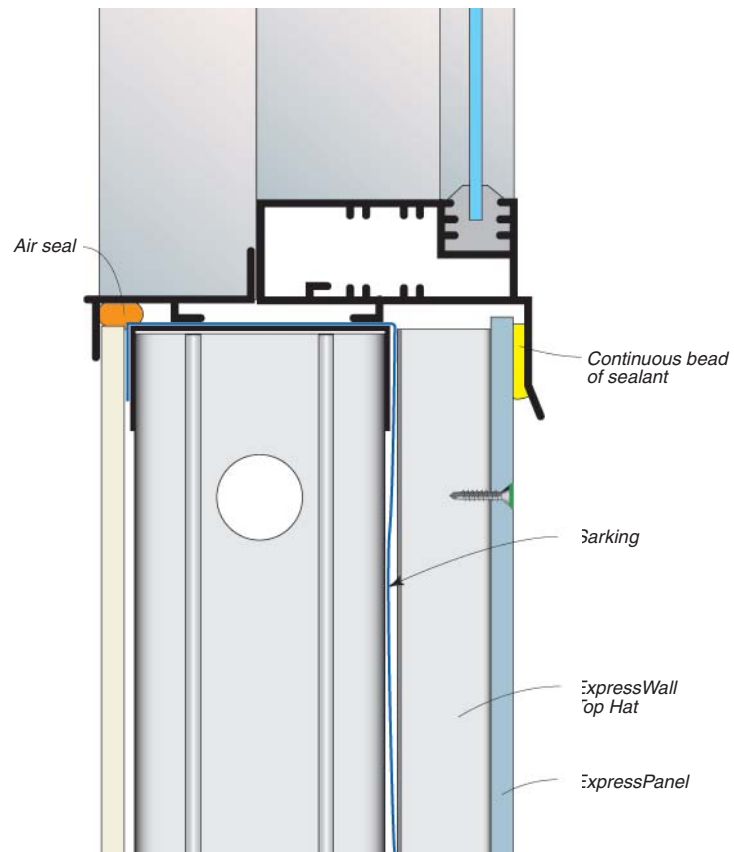
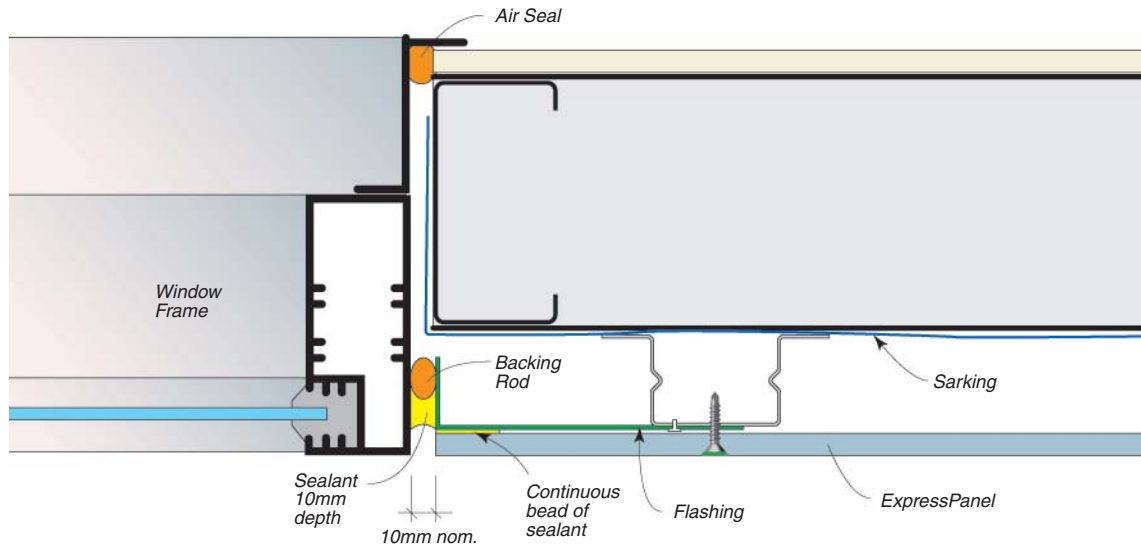


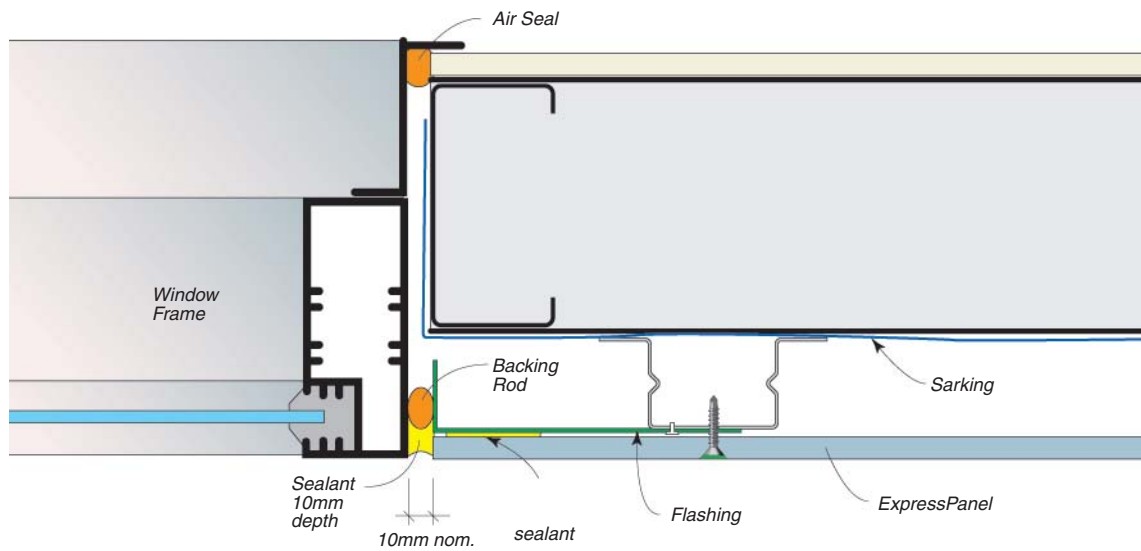
FIG 51: Window Sill Detail



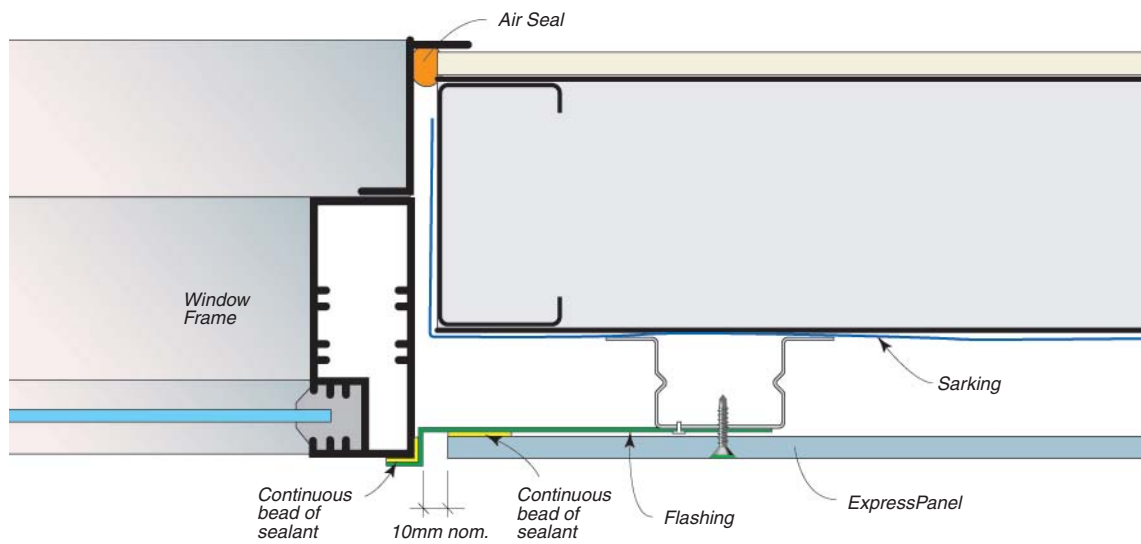
**FIG 52: Window Jamb Detail
Option 1**



**FIG 53: Window Jamb Detail
Option 2**



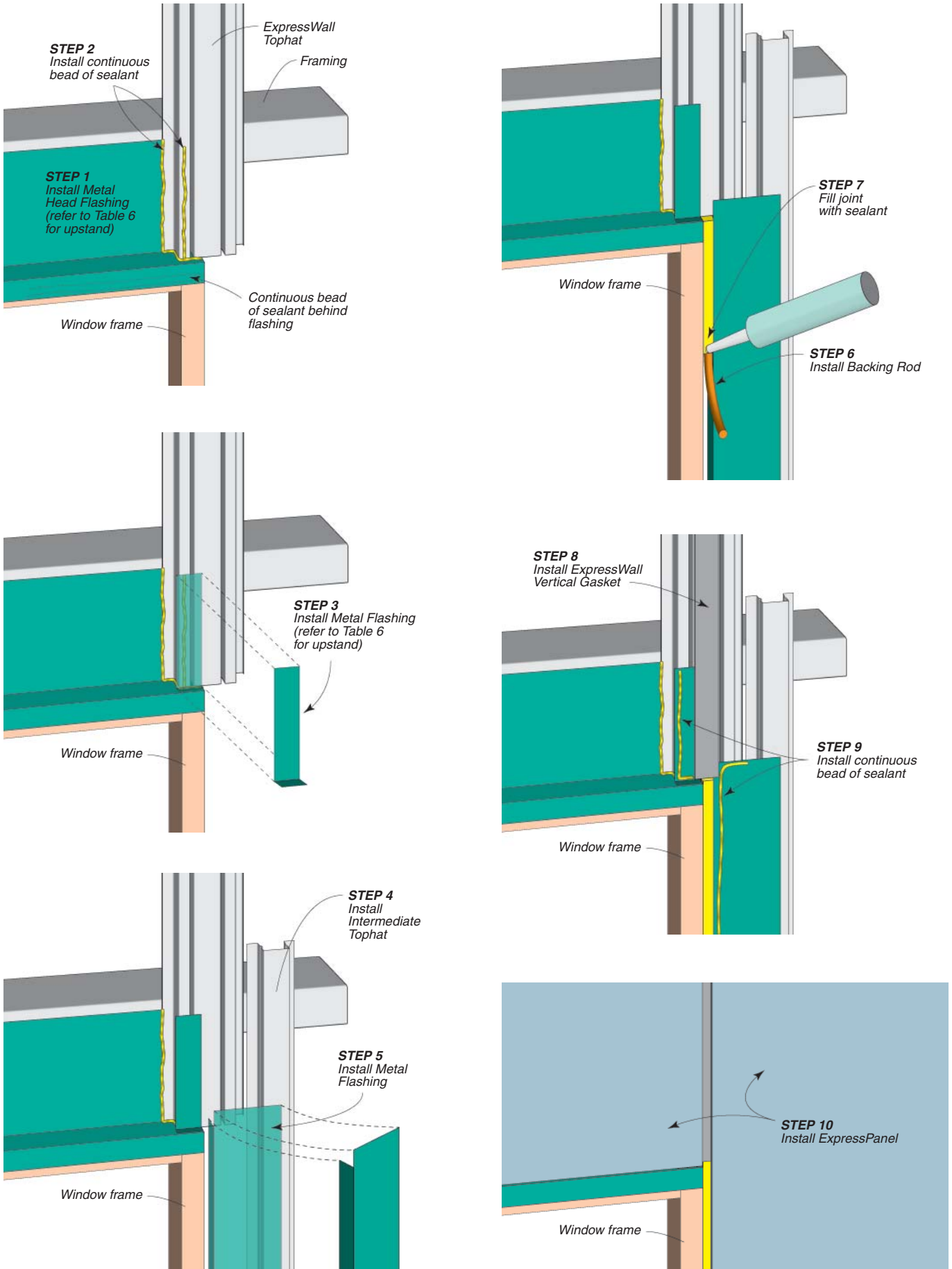
**FIG 54: Window Jamb Detail
Option 3**



WINDOW FLASHING PROCEDURE

The installation of window flashings will depend on the chosen windows and framing methods. The following details show a typical installation procedure.

FIG 55: Typical Window Flashing Procedure



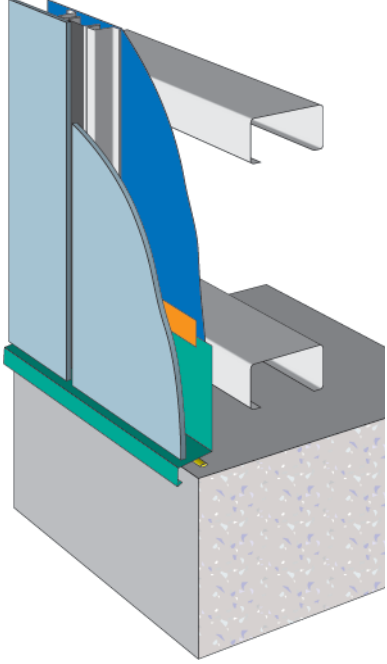
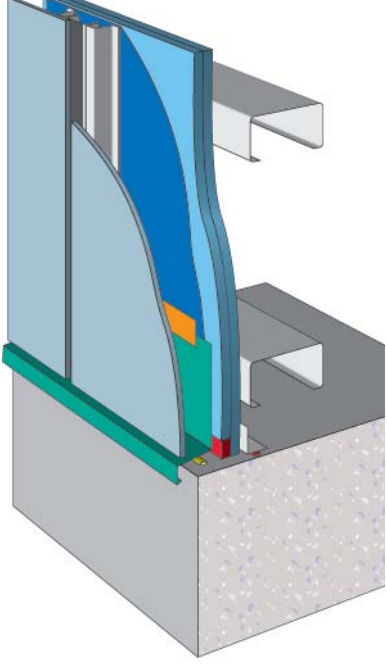
FIRE RATED WALL SYSTEMS

Cemintel Commercial ExpressWall™ can be used with a variety of CSR Gyprock and Fibre Cement fire rated wall systems.

These can provide a fire rating from one or both sides of the wall depending upon the internal lining materials chosen.

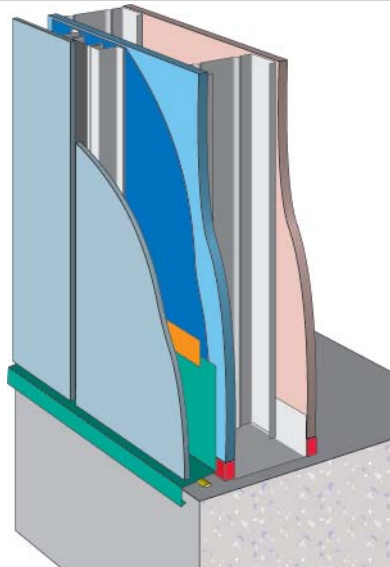
Refer to the system tables for detailed information.

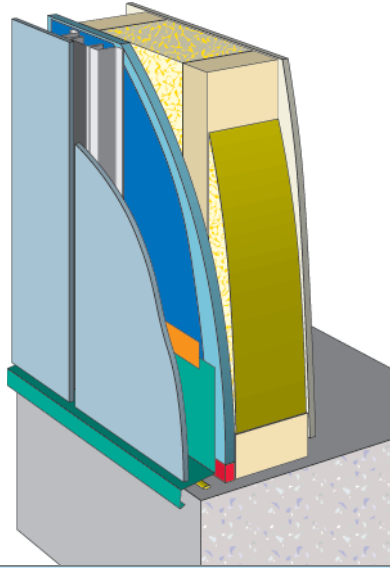
For detailed information on fixing fire rated linings, refer to the CSR Gyprock Fire & Acoustic Design Guide, N°GYP500.

<p>FRL - / - / -</p>	<p style="text-align: center;">CSR 933</p> <p><i>External Side of Wall Framing</i></p> <ul style="list-style-type: none"> • 1 layer Cemintel ExpressPanel™ fixed to Cemintel ExpressWall™ top hat framing system. • Sarking. <p><i>Internal Side of Wall Framing</i></p> <ul style="list-style-type: none"> • Nil. 		<p>Rw 25</p>
	<p>WALL WIDTH (excluding wall frame) mm</p>	<p>44</p>	
<p>FRL 60/60/60 from outside of the wall only</p> <p>Report/Opinion FCO 1640</p>	<p style="text-align: center;">CSR 934</p> <p><i>External Side of Wall Framing</i></p> <ul style="list-style-type: none"> • 1 layer Cemintel ExpressPanel™ fixed to Cemintel ExpressWall™ top hat framing system. • Sarking. • 2 layers x 16mm GYPROCK FYRCHEK MR plasterboard fixed to framing spaced at 600mm maximum centres. <p><i>Internal Side of Wall Framing</i></p> <ul style="list-style-type: none"> • Nil. 		<p>Rw 38</p>
	<p>WALL WIDTH (excluding wall frame) mm</p>	<p>76</p>	

NOTE:

For additional fire and acoustic systems, please refer to the CSR Gyprock Fire & Acoustic Design Guide, N°GYP500.

CSR 935		R_w 41 – 48	
<p style="text-align: center;">FRL 60/60/60 from both sides of the wall</p> <p style="font-size: small;">Report/Opinion FCO 1387</p>	<p style="text-align: center;"><i>External Side of Wall Framing</i></p> <ul style="list-style-type: none"> 1 layer Cemintel ExpressPanel™ fixed to Cemintel ExpressWall™ top hat framing system. Sarking. 1 layer x 16mm GYPROCK FYRCHEK MR plasterboard fixed to framing. Steel stud framing as required. <p style="text-align: center;"><i>Internal Side of Wall Framing</i></p> <ul style="list-style-type: none"> 1 layer x 16mm GYPROCK FYRCHEK plasterboard fixed to framing. 		
	STUD DEPTH		
	CAVITY INFILL		R _w
	(a) Nil		41 44
	(b) R1.5 Bradford Gold Batts		46 48
	(c) ASB4/TSB4 Polyester Batts		46 48
	WALL WIDTH mm		168 226

CSR 905		R_w 41 – 46	
<p style="text-align: center;">FRL 60/60/60* from outside of the wall only</p> <p style="font-size: small;">Report/Opinion FCO 1404</p>	<p style="text-align: center;"><i>External Side of Wall Framing</i></p> <ul style="list-style-type: none"> 1 layer Cemintel ExpressPanel™ fixed to Cemintel ExpressWall™ top hat framing system. Sarking. 1 layer x 16mm GYPROCK FYRCHEK MR plasterboard fixed to framing. Timber stud framing as required. <p style="text-align: center;"><i>Internal Side of Wall Framing</i></p> <ul style="list-style-type: none"> 1 layer x 10mm GYPROCK plasterboard CD fixed to framing. 		
	STUD DEPTH		90
	CAVITY INFILL		R _w
	(a) Nil		41
	(b) R1.5 Bradford Gold Batts		46
	(c) ASB4/TSB4 Polyester Batts		45
	WALL WIDTH mm		160

NOTE: *Load Limits Apply
For additional fire and acoustic systems, please refer to the CSR Gyprock Fire & Acoustic Design Guide, N°GYP500.

FIG 56: Typical ExpressWall™ Fire Rated Installation. (FRL 60/60/60 from outside only)

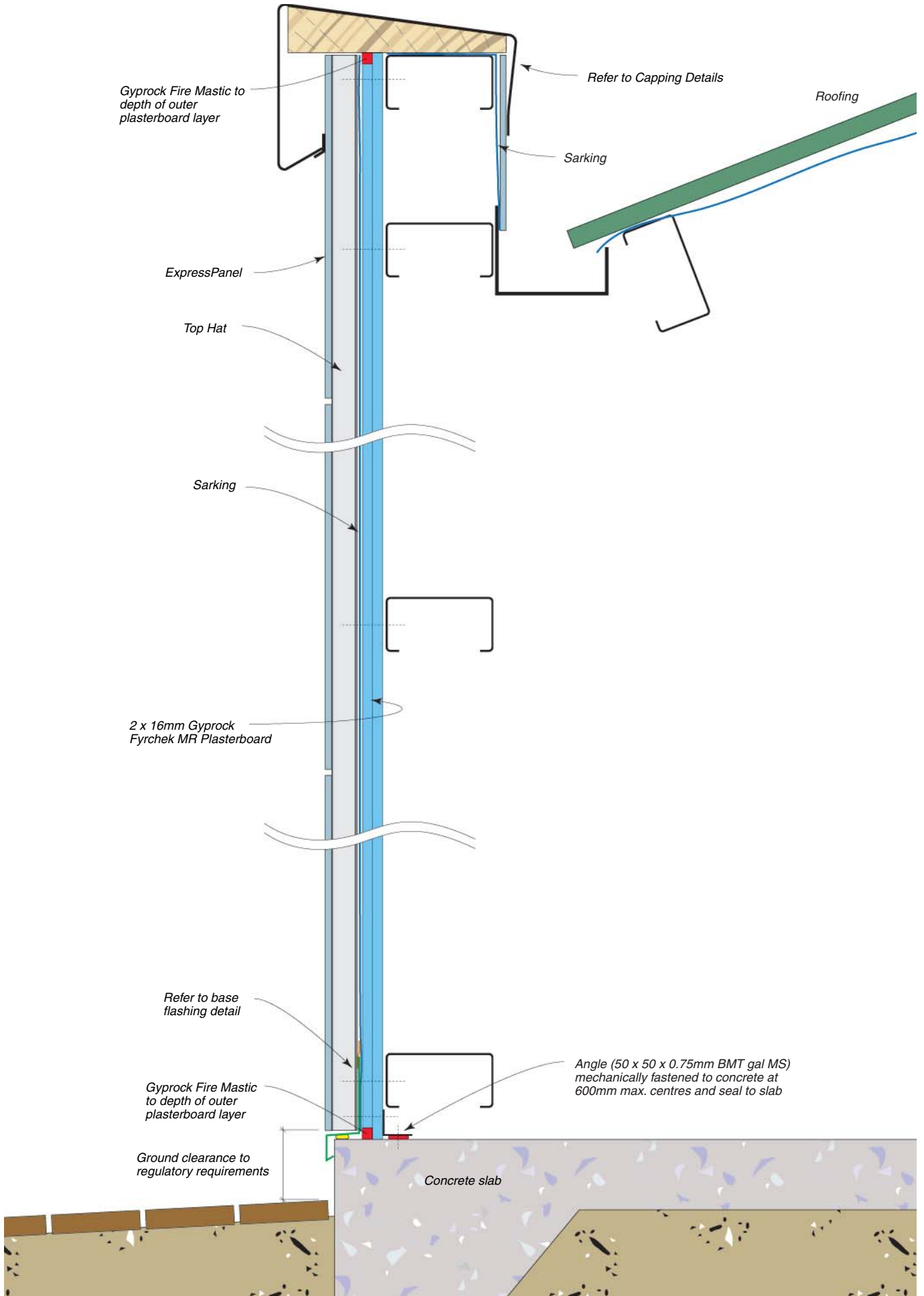
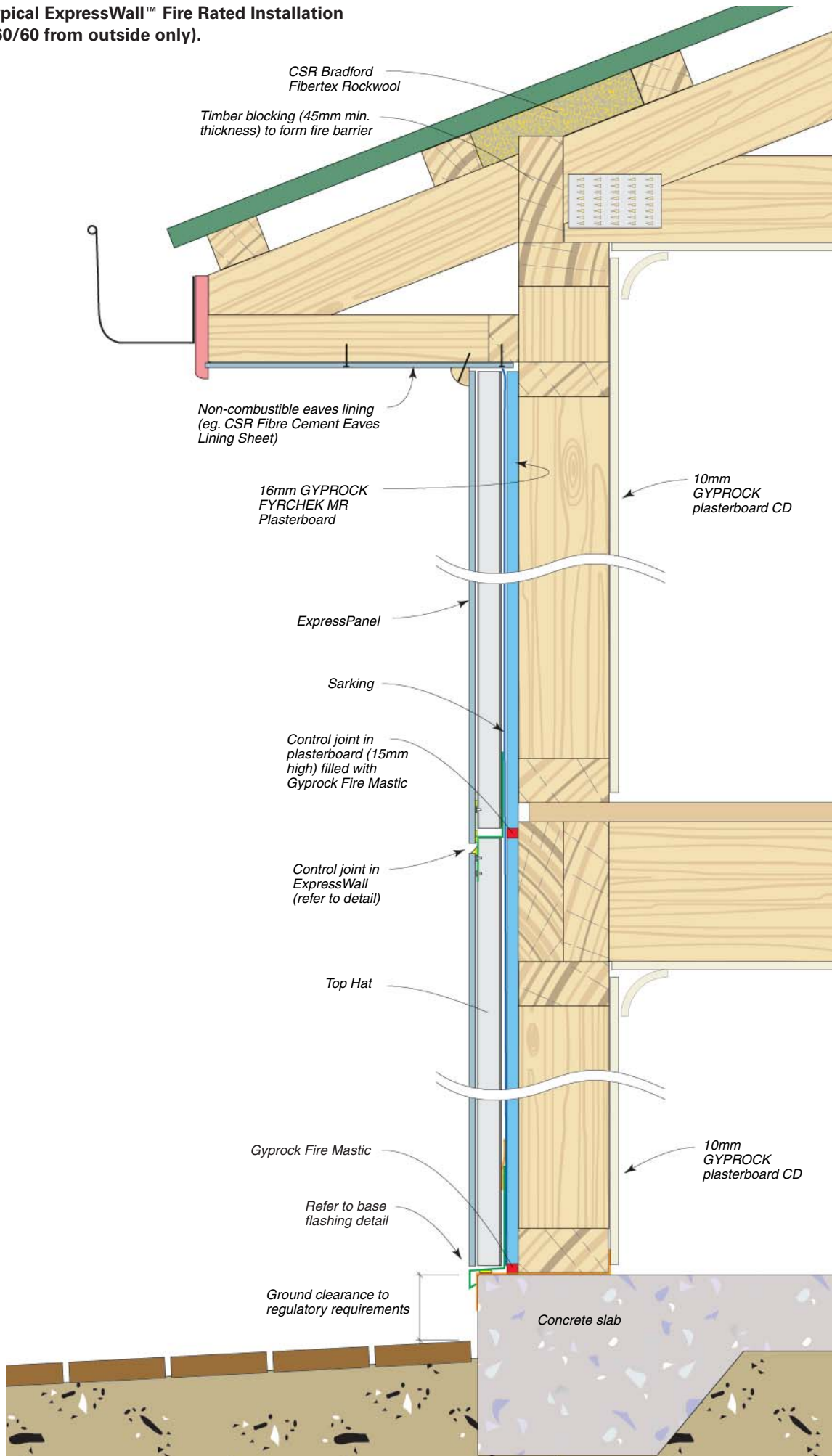


FIG 57: Typical ExpressWall™ Fire Rated Installation (FRL 60/60/60 from outside only).



ARCHITECTURAL SPECIFICATION

SCOPE

The contractor shall furnish all materials, labour and equipment for the installation of the Cemintel Commercial ExpressWall™ System where indicated on the drawings and/or as specified.

The Commercial ExpressWall™ system shall be installed in accordance with CSR guide N°FC126 Cemintel Commercial ExpressWall™.

CLADDING MATERIALS

Cladding material shall be Cemintel ExpressPanel™ as manufactured by CSR.

ExpressPanel™ shall be 9mm compressed cellulose reinforced sheet manufactured in accordance with AS/NZS 2908.2.

Back face is sealed with VC-9, a UV cured high build clear sealer applied to a thickness of 35-40µm. Front face of panels is undercoated with VC-7, a UV cured high build white sealer applied to a thickness of 35-40µm. Final coat is VP-200 white Intercoat primer with a thickness of 5-10µm to front face and edges.

EXPRESSWALL™ STEEL FRAMING

Cemintel Commercial ExpressWall™ steel framing system shall be *Cemintel ExpressWall™ Top Hat of BMT* as supplied by CSR, and Intermediate Top Hat as manufactured by Rondo Building Services Pty Ltd. Framing shall be installed in accordance with CSR guide N°FC126 Cemintel Commercial ExpressWall™.

SARKING

Sarking material shall be **Bradford*or product of equivalent or better performance).

CAVITY INFILL INSULATION

Cavity infill shall be **Bradford*.....(or product of equivalent or better performance).

FLASHINGS

Flashings not supplied by CSR shall be designed and installed in accordance with SAA-HB39, 1997, Installation Code for Metal Roofing and Wall Cladding. Flashing to be colour matched to the panels.

FIXINGS

Screws for fixing ExpressPanel™ to top hats shall be **ExpressWall Countersunk Head Screws, Class 3 finish*. All counter sunk head screws in the ExpressPanel™, shall be covered with **..... epoxy*, and sanded flush with the panel surface.

OR

Screws for fixing ExpressPanel™ to top hats shall be *ExpressWall Exposed Head Screws, *Class 3 finish/ *Stainless Steel* as supplied by CSR. ExpressWall™ Weather Seal shall be used with all exposed head screws. **Exposed head screws shall be colour matched to the panels*.

ACCESSORIES

Tapes, gaskets, sealants, backing strips and the like shall be as detailed in CSR guide N°FC126 Cemintel Commercial ExpressWall™.

COATINGS

ExpressPanel™ shall be *coated with *....., colour *.....*, which shall be installed to the manufacturer's recommendations.

FIRE RATED WALL SYSTEM

The contractor shall supply and install wall system **N° CSR* in accordance with CSR Gyprock Fire & Acoustic Design Guide, N°GYP500. The wall shall have a *Fire Resistance Level *FRL...../...../.....* in accordance with the requirements of AS1530.4. Installation shall also be carried out to the level specified for an acoustic performance of **R_w.....* using cavity infill of **Bradford*

FRAMING, FIXING & JOINTS.

All Commercial ExpressWall™ framing, fixing and joints shall be designed and installed to comply with the requirements for an Ultimate Design Wind Pressure of **.....kPa* minimum.

Note: **Insert or select appropriate product/information.*

MATERIAL PROPERTIES

ExpressPanel™ Manufacturing Tolerances

Length	+0 to -2mm.
Width	+0 to -2mm.
Thickness	+10% to -0%.
Diagonals Difference (max)	2mm
Edge Straightness deviation (max)	1mm

Physical Properties

Property	Cemintel™ Compressed Sheet	
	at EMC*	Saturated
Density (kg/m ³)	1700	1900
Flexural Strength (characteristic)		
Parallel to sheet length		
- ultimate (MPa)	25	20
- yield (MPa)	20	13
Parallel to sheet width		
- ultimate (MPa)	20	16
- yield (MPa)	17	12
Modulus of Elasticity (GPa)	10	9
Thermal Expansion Coefficient	10 x 10 ⁻⁶ /K° (est. average)	
Moisture Movement		
- from EMC* to saturated	≈ 700 Microstrains (expansion)	
- from 30 to 90% RH (to ASTM C1185)	≈ 500 Microstrains (expansion)	

NOTE: * EMC (Equilibrium Moisture Content) is at nominally 23°C and 50% Relative Humidity environment conditions.

FIRE RESISTANCE

Under the Building Code of Australia, C1.1 Clause 2.5(e), Cemintel™ fibre cement is deemed to be non-combustible. When tested in accordance with AS1530.3, the Early Fire Hazard Indices are as follows:

Ignitability	0
Spread of Flame	0
Heat Evolved	0
Smoke Developed	0

SYSTEM TESTING

The Cemintel Commercial ExpressWall™ System has been designed and tested by CSR Gyprock & Fibre Cement Research & Development. The Commercial ExpressWall™ System has passed testing to the following parts of AS/NZS4284-1995 Testing of Building Façades.

- Structural Test.
- Water Penetration by Static Pressure.
- Water Penetration by Cyclic Pressure.
- Proof Test.

The system has been tested to AS4040.3-1992 Methods of testing roof and wall cladding, Method 3 : Resistance to wind pressure for cyclonic regions.

HANDLING & STORAGE

All Cemintel ExpressPanel™ must be stacked flat, clear of the ground, and supported on a level platform.

Care must be taken to avoid damage to edges, ends and surfaces.

Material must be kept dry, preferably by being stored inside the building. Protect from contaminants such as silicone spray.

Where it is necessary to store panels outside, they must be protected from the weather.

Panels must be dry prior to fixing and finishing.

SAFETY

When cutting ExpressPanel™ using power tools, always ensure the work area is well ventilated. An approved dust mask (AS1715 and AS1716) and safety glasses (AS1337) must be worn. CSR recommends that hearing protection be worn.



PANEL CUTTING

POWER SAW

When it is necessary to use power tools for cutting Cemintel ExpressPanel™, CSR recommends using the Hitachi Fibre Cement Power Saw Blade. This blade is specifically designed for use with fibre cement and produces a superior cut compared to conventional blades.

It is ideal for use with the Hitachi C7YA dustless circular saw and other 185mm circular saws fitted with vacuum extraction systems.



**Hitachi C7YA Dustless
Circular Saw with Dust
Extraction System.**

**Hitachi Fibre Cement
Power Saw Blade.**

DRILLING

Cemintel ExpressPanel™ fixing holes shall be drilled and countersunk with the recommended countersinking tool. All general purpose drilling shall be done with a masonry drill bit.

NOTE: In all cases DO NOT use hammer action when drilling.

NOTES:

NOTES:



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fibre cement systems

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HEALTH & SAFETY

WARNING

Fibre Cement products contain crystalline silica. Repeated inhalation of fibre cement dust may cause lung scarring (silicosis) or cancer. Do not breathe the dust. When cutting sheets, use the methods recommended in this brochure to minimise dust generation. If power tools are used, wear an approved dust mask (respirator). These precautions are not necessary when stacking, unloading or handling fibre cement products.

For further information and for a Material Safety Data Sheet, phone 1800 807 668.

GUARANTEE

CSR Building Products Ltd ("CSR") warrants for 10 years from the date of purchase, that Cemintel ExpressPanel™ will be free of defects in materials and manufacture, subject to the conditions outlined below.

For the warranty to be effective, the Cemintel ExpressPanel™ must be installed strictly in accordance with the recommended installation methods as shown in the current Cemintel Commercial ExpressWall™ brochure at the time of construction, and CSR's recommended accessories must be used.

Warranty Conditions

The warranty only covers ExpressPanel™ provided by CSR.

Under no circumstance will CSR be liable for defects arising from poor workmanship or defective materials not supplied by CSR.

Any warranty claim must be made within 30 days of the alleged defect becoming apparent.

If a CSR product does not meet our standard, we will, at our option, replace or repair it, supply an equivalent product, or pay for doing one of these.

This warranty excludes all other warranties and liability for damage or loss in connection with defects in CSR's product other than those compulsorily imposed by legislation, notably the Trade Practices Act.

Cemintel™, ExpressWall™ & ExpressPanel™ are trademarks of CSR Limited

CONTACT DETAILS

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